

HOME CURING OF BACON AND HAMS



**BULLETIN No. 127 OF THE MINISTRY OF AGRICULTURE
AND FISHERIES . . . PUBLISHED IN CONJUNCTION WITH
THE SMALL PIGKEEPERS COUNCIL**

HIS MAJESTY'S STATIONERY OFFICE PRICE 1s. 3d. NET

FOREWORD TO FIRST EDITION

THE domestic curing of bacon and hams has been practised extensively for centuries in England and Wales. The quality of such produce has, however, always been variable, partly owing to local differences in method, partly because the principles were not generally understood; and up to the present there has been no school of instruction devoted to bacon curing comparable with schools of, e.g., dairy instruction.

With changing habits, extension of commercial resources and the imposition of strictly sanitary regulations, home curing tended, before the war, to become a dying art.

But since 1939 many people have found it advantageous to augment their rations by keeping a pig for home consumption. The Small Pig Keepers' Council, in the course of stimulating pig keeping, has noted that the efforts of such producers are liable to be wasted because often they do not know how to deal with the carcass effectively at home, and war-time conditions preclude assistance from commercial curers.

To remedy this situation, the Small Pig Keepers' Council set up a Home Curing Committee under the Chairmanship of Dr. John Hammond, School of Agriculture, Cambridge. The Committee has in addition included officers of the S.P.K.C. and of the Ministry of Agriculture, as well as of the Department of Scientific and Industrial Research and the London County Council's Smithfield Institute. The results of their labours up to date are referred to in the Introduction to this Manual of Instruction.

The Small Pig Keepers' Council desires to place on record its appreciation of the valuable services of the Home Curing Committee and of its Technical Sub-committee.

CEDRIC DREWE,

Chairman,

Small Pig Keepers' Council.

64, Bell Street,
Henley-on-Thames.

December, 1943.

FOREWORD TO SECOND EDITION

WHEN the Manual of Instruction in Home Curing was first issued in 1943 those responsible for its compilation had no illusions as to its tentative character. For the first time information on an art which had been practised for generations, but about which comparatively little had been recorded, had been brought together and extended to cover certain new ideas. That there was a demand for such a book was known, but it is doubtful whether anyone expected that the first printing would be sold out almost immediately and the subsequent reprints taken up so quickly. As an alternative to a further reprint a second edition to allow for desirable amendments and additions is thought to be justified.

Sufficient experience has now been gained in the application of the Graduated Cure to justify its recommendation to domestic pigkeepers and others who, for one reason or another, cannot or do not wish to store bacon in large pieces. However, it is not claimed that this particular cure either



22502576049

MINISTRY OF AGRICULTURE AND FISHERIES

BULLETIN No. 127

HOME CURING OF BACON AND HAMS

A MANUAL OF THEORY AND PRACTICE
FOR INSTRUCTORS AND OTHERS

COMPILED BY THE SMALL PIG KEEPERS' COUNCIL

(COPYRIGHT RESERVED)



LONDON

PRINTED AND PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE

To be purchased directly from H.M. STATIONERY OFFICE at the following addresses:

York House, Kingsway, London, W.C.2; 13a Castle Street, Edinburgh 2;

39-41 King Street, Manchester 2; 1 St. Andrew's Crescent, Cardiff;

80 Chichester Street, Belfast;

or through any bookseller

1945

Price 1s. 3d. net

INTRODUCTION

A Conference held at Cambridge in July, 1942, under the auspices of the Small Pig Keepers' Council and the Ministry of Agriculture, resolved "that the Rural Domestic Economy Instructresses afford the best means of disseminating instruction in home curing of bacon, and that as a preliminary step a Central School of Instruction be set up for the purpose of providing the necessary guidance to such instructresses; further, that a Committee be appointed to consider how best to co-ordinate and organize instruction in home curing and to draft a syllabus for the central training of instructresses."

The Committee began by surveying the field and collected as much information as circumstances allowed about curing under domestic conditions and the use of parts of the pig not suitable for conversion into bacon or ham; secondly, the Committee wished to review, in the light of experience, curing under war-time conditions; and thirdly, they had to consider the problem of imparting instruction and guidance.

In January and March, 1943, experimental courses of instruction were held, and as a result of the experience gained it was felt that further training of instructresses and instructors should be centralized at one spot and be the responsibility of a special staff.

To this end it was decided to collate such information and experience as had already been obtained and to publish it in the form of a Manual of Instruction. A small Technical Sub-committee consisting of Mrs. S. Stevens (Ministry of Agriculture) and Mr. F. Gerrard (Smithfield Institute), under the Chairmanship of Mr. H. R. Davidson (Technical Officer, S.P.K.C.), was appointed to prepare the Manual and draft a syllabus of practical instruction for future training courses.

In this connexion the Committee felt that further investigation was necessary to clear up a number of problems that had come to light. It was also realized that some of those who would be called on to instruct might feel the need of a wider course in order to give them the background of knowledge about pigs and meat that is necessary to deal with enquiries from people with considerable practical experience. A further point was the extent to which official instruction should be given in more than one of the various applications of cure which are practised up and down the country.

Such considerations made it seem at first that time should be devoted to the collection of further information and to the fundamental training of those who would be called upon to instruct. The exigencies of war-time conditions, however, imposed the necessity of taking immediate steps to train sufficient instructresses and instructors to deal with the winter curing period of 1943-44.

In pursuance of this policy it was decided to advocate, and to train personnel to teach, one simplified and standardized method of cutting and curing. The possible objections to such a course were clear to the Committee, but it was forced on them by the urgency of the situation.

The present Manual of Instruction has, therefore to be regarded as a provisional one, based on, as yet, incomplete data and purposely restricted in scope. It is hoped that if wider facilities become available it may be possible to continue with the study of this subject and to publish a revised and enlarged manual later.

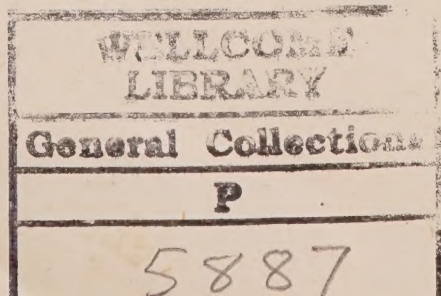
December, 1943.

JOHN HAMMOND,

(Chairman, Home Curing Committee.)

ALEC HOBSON,

(Secretary.)



HOME CURING OF BACON AND HAMS

CONTENTS

	Page		Page
HISTORICAL NOTE	1	WASHING, MATURATION, SMOKING AND STORING	38
STRUCTURE, FUNCTION AND UTILIZA- TION OF THE DIFFERENT BODY PARTS OF THE PIG	3	BACTERIA, MOULDS AND PESTS ...	40
BODY PROPORTIONS AND BREED TYPE... ..	10	PREPARATION AND COOKING OF HOME-CURED MEATS	40
PRINCIPLES OF FEEDING IN RELATION TO CURING	14	LOCAL METHODS OF CURING ...	42
CARE AND MANAGEMENT IN RELATION TO CURING	15	JUDGING HOME-CURED BACON AND HAMS	48
SLAUGHTER	16	REGULATIONS AFFECTING THE SLAUGHTER AND DISPOSAL OF PIGS	48
INSPECTION OF OFFALS AND CARCASS	19	NATIONAL AND LOCAL CHANNELS OF INFORMATION	49
METHODS OF CUTTING	21	APPENDICES :	
PREMISES, EQUIPMENT AND UTENSILS FOR HOME CURING	24	I. UTILIZATION OF BY-PRODUCTS	49
PRINCIPLES OF PRESERVATION BY CURING	25	II. WEIGHTS	54
A STANDARD GRADUATED CURE ...	33	III. GLOSSARY	56
		IV. BIBLIOGRAPHY	59
		INDEX	60

HISTORICAL NOTE

The preservation of pig meat by curing it with salt is a very old process. As early as 200 B.C. Cato the Censor wrote that the inhabitants of Lombardy salted three or four thousand flitches a year. His recipe for salting hams was as follows:—

“ When you have bought your hams, cut off the hoofs. Take half a peck of Roman salt, ground fine for each. Lay salt over the bottom of the tub; then put in a ham, the skin-side looking downwards. Cover it over with salt. Then put another ham on top, taking care that meat does not touch meat. So deal with them all. When you have got them all snug put salt over them, so that no meat is visible, and make the surface level. When they have been in salt five days take them all out and the salt with them. Then put them in again in reverse order so that those which were before on top are now at the bottom. Cover them over and make them snug in the same way as before. After twelve days at most, take the hams out, rub off all the salt and hang them up in a draught for two days. On the third day wipe them well over with a sponge and rub them with oil. Hang them for two days in the smoke. Then take them down, rub them well with a mixture of oil and vinegar and hang them up in the meat larder.”

By the 14th century it was a sign of poverty in this country to be without bacon. Piers Plowman writes:—

“ I have no penny, pullets for to buy,
No, neither goose nor pig but only two green cheeses,
A few curds, a little cream and a haver-cake,
And two loaves of beans and bran for my little ones;
And, by my soul, I say I have no salt bacon.”

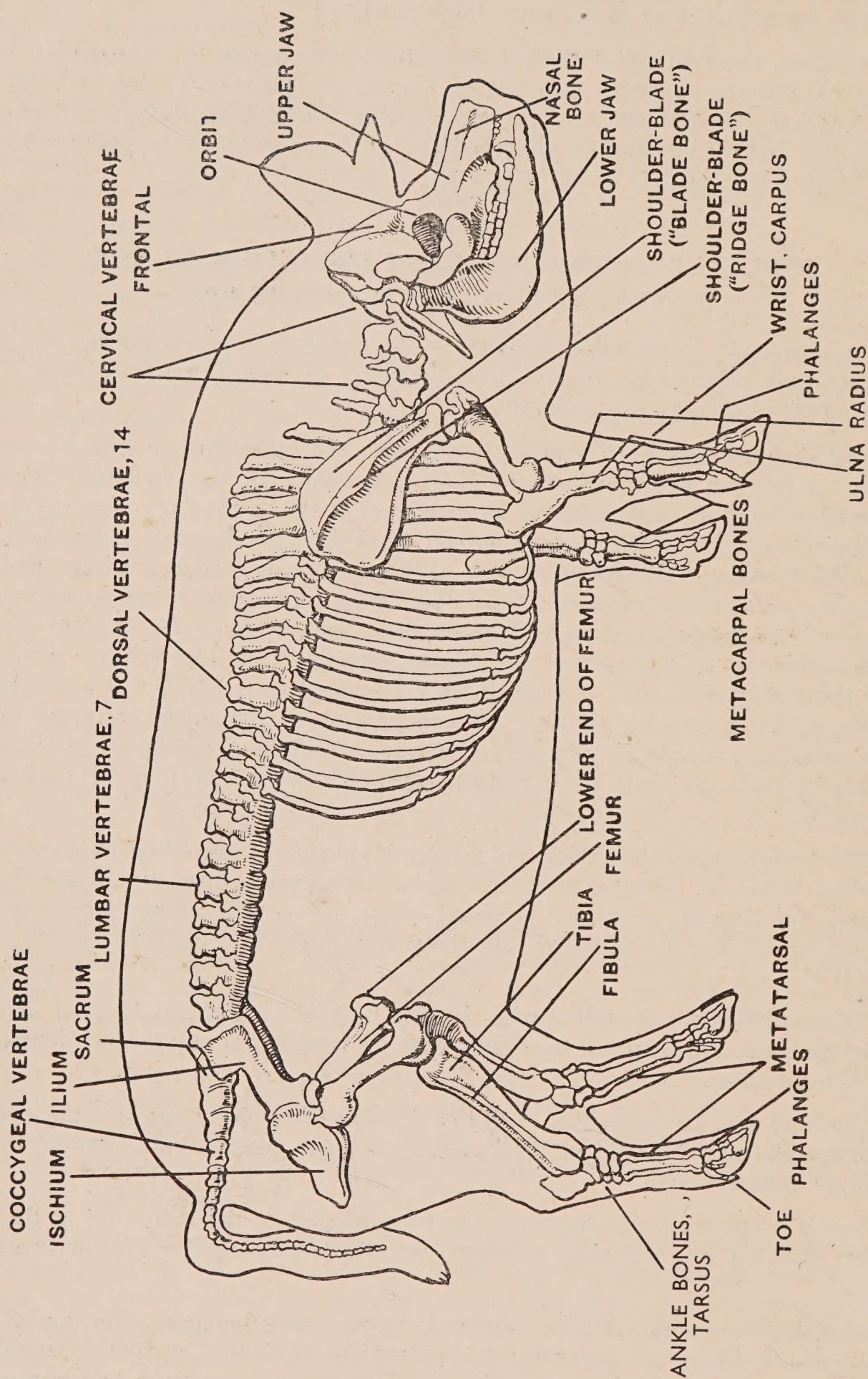


FIG. 1.—Skeleton in Live Pig.

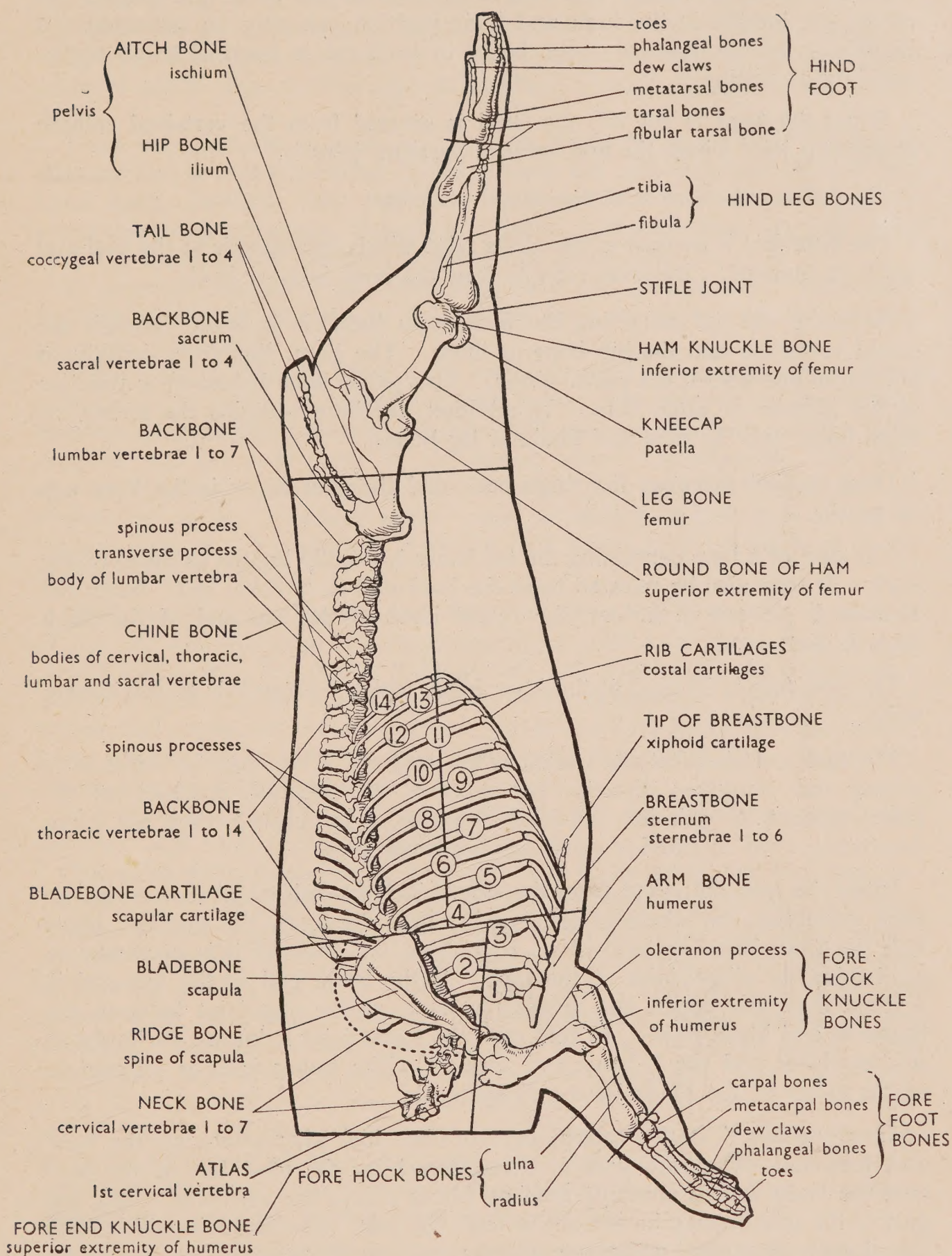


FIG. 2.—Location of Bones and Cuts in a Side as recommended for the Standard Graduated Cure.

Flesh (see Fig. 2). Round these bones and attached to them are the muscles which form the lean meat of the carcass. When the carcass has been dressed and cut down the middle into two sides some of the bones are visible, but others are hidden in the flesh and their position can only be estimated. A knowledge of the position of the bones in each cut is essential to an understanding of cutting.

When the *head* is cut off, the skull is severed from the vertebral column at the cup joint where the first cervical vertebra joins it.

The *tail* is cut off close to the sacral vertebrae.

The *hind* foot is severed at the ankle joint which corresponds to the heel and ankle of humans. Butchers refer to it as the hock joint or hock.

Normally the cut removing the *ham* from the side is made through the sacral vertebrae and the hip bone or ilium. The ham, therefore, contains a portion of one side of the pelvic girdle. This pelvic bone is known in practice as the H-bone or aitch bone. In addition, the ham contains the femur, or thigh bone, and the tibia and fibula or leg bones.

Over the join between the thigh bone and the shin bones is the knee cap or patella.

The part of a ham containing the leg bones is usually known as the gammon hock. It may also be referred to as the hock-end or knuckle end. When the H-bone is cut out of a ham the round knob of the top end of the thigh bone is seen.

The *fore-foot* is severed at the knee joint, which corresponds to the human wrist.

The fore and hind-feet are known as the trotters. They may be boiled after salting and consumed directly, hot or cold. On account, however, of the large amount of gelatine obtained from them by boiling they are more commonly used to provide stock for brawn or pies.

When the *fore-end* is cut from the side it includes half of all the cervical or neck vertebrae, the whole of the fore-leg (less the foot), the shoulder blade and the front three or four ribs. In cutting the fore-end it is necessary to get behind the elbow joint of the ulna. If the lower end of the fore-end is severed from the upper, the division is made at the cup joint between the humerus and blade bone. In that case the lower joint is known variously as the fore-hock and the "hand and spring." The upper joint is referred to as the collar or the blade bone and spare-rib.

The "*middle*" is the central part of the side, after removing the ham and fore-end. The fore part is strengthened by the ribs, but in the rear part the body wall is not supported by bones except the vertebrae. The top part of the middle may be cut out to form the *loin*. The fore loin will include the dorsal vertebrae, while the lumbar and sacral parts of the vertebrae provide the bones in the hind loin.

Under the lumbar vertebrae of the hind loin is found the *fillet* or tender loin. This is mainly the Psoas muscle which helps to move the hind leg. In preparing the carcass for curing it is removed for consumption as fresh meat.

The lower part of the "middle" is known as the *belly* or *streak*. The latter name is associated with the fact that the body wall is here composed of alternate layers or streaks of fat and lean. The forward part of the belly contains part of the sternum or breast bone and the lower ends of some of the ribs. The breast bone is made up of six segments (*sternebrae*) from the hindmost of which runs out the xiphoid cartilage forming the tip of the breast bone.

There are normally 14 pairs of ribs, and these end in cartilage extensions running into a communicating cartilage from the 14th to about the 7th rib; from these, forward, they run into the breastbone. These cartilages are commonly seen, cut across, in rashers of bacon, and sometimes they are, along with the bones of the sternum, trimmed out of the cuts.

In improved breeds of pigs there may be a 15th pair of ribs. These may be fully developed, though in some cases they are short and do not join the costal (rib) arch.

When a pig is stuck to bleed it the aim is to sever the carotid and pectoral arteries. The pectoral arteries run close to the forward part of the breastbone and if the knife is inserted too far it will puncture the tissues of the body wall in the fore-end, close to the breast bone. Consequently, the part of the fore-end which forms the forward part of the body wall is referred to as the "*sticking piece*" and, according to how it is cut, may contain most of the sternum. It is this part which may be damaged if the pig is "shoulder stuck."

Offals (see Fig. 3). The size and weight of offals will vary with the weight of the pig, and any approximate figures given refer to a pig of from 200 to 300 lb. live weight. The organs of the pig are contained within the body cavity. This is divided into two separate portions by the *diaphragm*, which is a wall of muscle and connective tissue running upwards and backwards from the breastbone, more or less in the plane lying between the last pair of ribs. In practice the diaphragm is often referred to as the skirt.

In front of it is the thorax surrounded by the ribs and containing principally the heart and lungs (lights or "lites").

Connexion with these organs from the head is by means of two systems. The respiratory system begins with the nostrils in the snout and continues through the nasal cavity down to the larynx or voice box. The nasal cavity and other cavities of the head are small and inaccessible. If the head is to be kept for making brawn it should be split into a number of parts so that salt or brine can easily penetrate into these spaces. From the larynx the wind-pipe (trachea) continues till it divides into two bronchial tubes. The wind-pipe is kept open by from 32 to 35 rings of cartilage so that it is of little value for human consumption. The right *lung* has four lobes and the left two or three. The lung tissue is less dense than in the ox or sheep and can be easily punctured by finger pressure. Provided the lung tissue is sound it can, after trimming away the main bronchial tubes, be used as an edible product in "made up" goods such as faggots, etc.

The *heart* is easily located, but preparation for human consumption involves removing from it the arteries and veins, and in cleaning from it all traces of coagulated blood.

Apart from the fact that some blood vessels pass through it, there is only one opening through the diaphragm. This is the oesophagus which carries the digestive or alimentary canal down from the head, through the thorax to

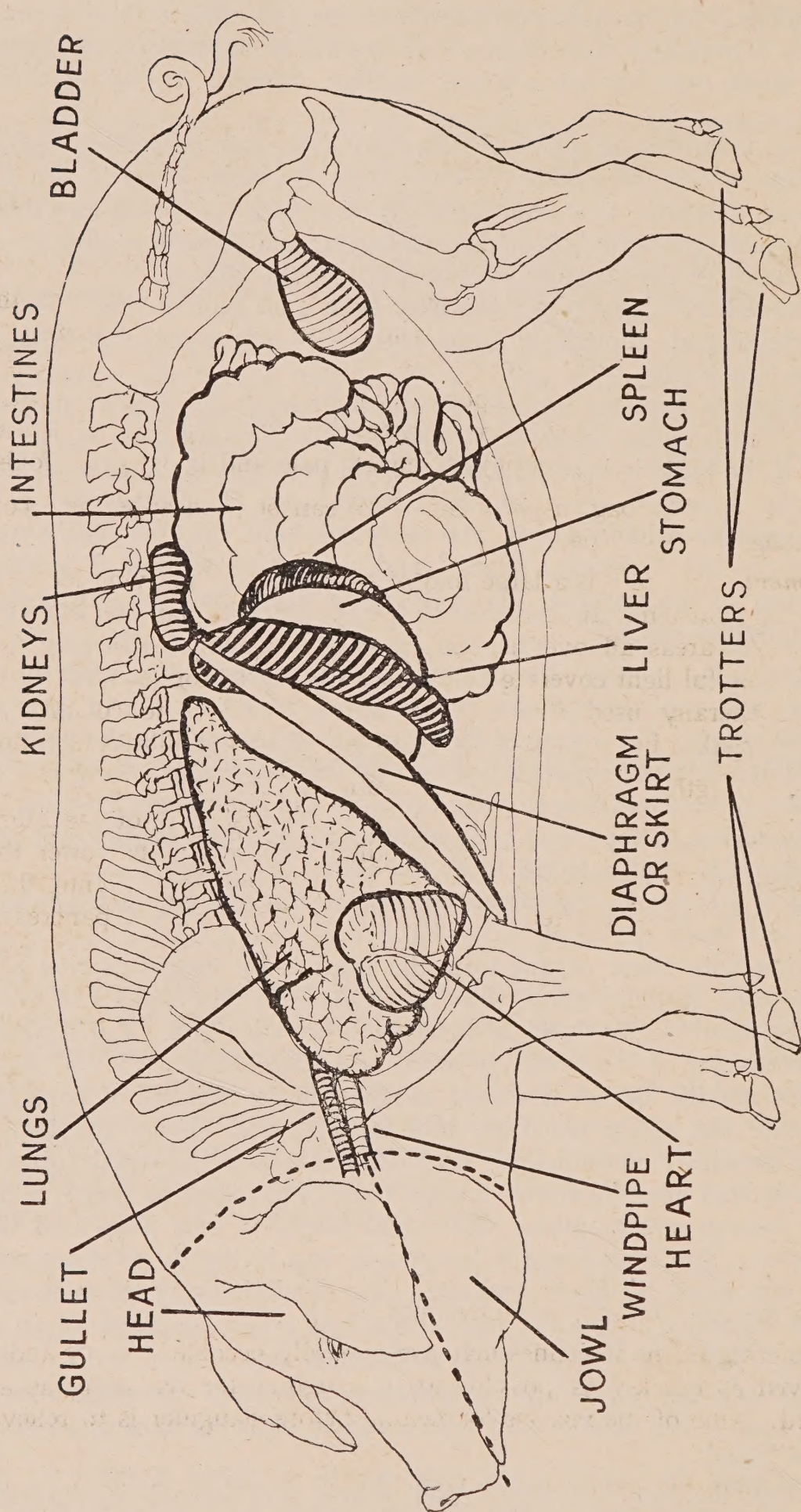


FIG. 3.—Location of Offals.

the stomach. The alimentary system begins in the mouth. The upper part of the head and part of the cheek is normally made into brawn, which may also include the tongue and meat from the lower jaw. The tongue, however, may be used separately, and each half of the lower jaw, when cured separately, becomes a "chap".

From the back of the tongue the food pipe starts with the pharynx and continues as the oesophagus straight down to the stomach. In the ox the *oesophagus* is known as the weasand, but the term commonly used in the case of the pig is "gullet." The oesophagus may be used by being chopped up and put into faggots, etc.

In the adult pig the *stomach* has a capacity of about 1½ gallons. The larger curved surface lies in close connexion with the diaphragm and with the liver and spleen, while the other surface is in contact with the intestines. There are four regions in the stomach. The upper blind end (cardiac) is rather thin and grey in colour. The portion in the vicinity of the oesophagus is rough and corrugated. The centre part (gastric) is reddish, while the area near the exit to the intestines (pyloric) is thinner, pale and in irregular folds.

The stomach (maybag, maw or nightcap) can be used either as a container for puddings or for tripe.

The *omentum* or caul is a large fold of connective tissue lying loosely round or over the stomach. It is usually impregnated with fat concentrated into spots or small areas all over it, and so it is commonly called the "veil". It makes a useful light covering of fat over lean meat for roasting, but in the pig it is generally used for covering faggots previous to cooking. It is desirable to soak it in warm water prior to use, as this facilitates handling.

The total length of the *intestines* amounts roughly to 15 times the length of the body. The small intestine, which is the first part of the alimentary canal after leaving the stomach, is so called because it is narrower than the large intestine. Its length in an adult pig is about 60 ft. Into the small intestine flow digestive secretions from the gall bladder and pancreas. The small intestine can be cleaned as described on page 54 and used for sausage containers.

The many coils of the small intestine are supported by a membrane whose frilled lower edge is attached to the intestine. This membrane is known as the mesentery and is composed of connective tissue. It is, however, usually heavily stored with fat and is often referred to simply as the mesenteric fat.

The large intestine in a mature pig would be about 15 ft. long. From it there extends a *cul de sac* known as the blind gut (caecum). It is about 1 ft. long and 3-4 in. wide.

The large intestine may be used to provide containers for sausage, but it is also used for consumption as chitterlings.

Fat adhering to the intestines may very rapidly become tainted, and should be removed as quickly as possible after slaughter for rendering as a lower grade lard. One of the reasons for fasting before slaughter is to relieve pressure on the intestines so that there is less risk of them being torn and the contents contaminating organs. Risk of taint is also reduced.

The *liver* is, from a nutritional point of view, the most valuable of the primary offals. It is relatively large and weighs about 4 lb.

It has four main lobes and tapers from the centre to a very fine edge. The surface presents a "nutmeg" appearance owing to the large amount of interlobular tissue and for this reason it can easily be distinguished from the liver of other meat animals.

It has several functions, including the storage of glycogen. It readily decomposes and should be consumed as soon as possible. It will keep better if its surface is allowed to dry than if it is kept moist.

Between the right and left central lobes on its visceral surface is situated the *gall bladder* containing gall or bile. Bile is a secretion formed in the cells of the liver and its main function is to emulsify fats in the intestine preparatory to their being absorbed. For this reason the bile or gall is frequently kept for cleaning purposes. As it is very bitter the greatest care should be taken to ensure that the bladder is not cut or ruptured when being removed from the liver.

The *pancreas* is a gland lying close to the stomach, which pours digestive juices into the small intestine near the duodenum. It is called the belly, gut or stomach sweetbread. It is somewhat triangular in shape, and though not the true sweetbread it proves quite a good substitute.

The *spleen*, known as the melt or milt, is a long narrow organ, red to purple in colour. As in other animals, it varies considerably in size and in adult pigs it may weigh up to $\frac{3}{4}$ lb. It is very loosely attached to the stomach and its position in the live animal will depend on the quantity of the stomach content. Its function is associated with the destruction and replacement of blood cells, and the blood content varies with different stages of digestion. It is usually included in the pig's fry, and it may be included in faggots or puddings.

The *thymus* is a gland near the throat which forms the true sweetbread. In young animals this gland is relatively large, reaching the larynx, or even extending into the space between the angle of the jaws. Its function is somewhat complex, but it appears to form the white corpuscles of the blood, and to be associated in some way with the sex glands.

The *kidneys* are non-lobulated structures, bean shaped and flattened, with a length about twice their width. They are usually parallel and are situated beneath the transverse processes of the first four lumbar vertebrae. Occasionally the left kidney may be slightly further forward than the right one. Except in young or thin pigs they are covered in fat, this being a continuation of the flare fat lining the belly wall.

The kidneys are connected by ducts, the ureters, with the bladder, which in the pig is relatively large. The bladder should be washed and inflated prior to use as a container for lard. The function of the kidneys is to remove water in which are dissolved the waste products of the body, including urea. For consumption, kidneys can be grilled or fried, or they may be used to flavour pies and stews.

BODY PROPORTIONS AND BREED TYPE

Under normal conditions of retail trade the purchaser is free to buy what cut of meat he likes. The value for cooking purposes of the different cuts varies very widely according to their composition. Speaking generally the ideal cut for most purposes is one in which there is no bone, that being waste

from the edible point of view, and in which the lean meat is formed from large muscle bundles with no ligaments and very little connective tissue round or through them. There should, however, be a reasonable amount of fat for cooking purposes round the outside of the cut.

Ideal cuts of this kind obviously form only a small proportion of the carcass. In the pig as in other meat animals the carcass can be roughly divided into three according as it provides good, medium or poor cuts from this point of view. The commercial production of pigs for bacon factories involves attention to the proportion of good cuts in the carcass, because the price obtained by the factory from the retailer per cwt. of whole cured side depends on the proportion of higher priced cuts in the side.

In home curing for domestic consumption, conformation is not nearly so important, for the whole of the carcass has to be consumed by the owner irrespective of its conformation quality. Nevertheless it must always be remembered that the extent to which pig meat is satisfactorily preserved depends not alone on the ingredients or the method of their application, but on a whole chain of factors, each of which has to be understood.

The thickness or thinness of the meat controls the time in salt. The rate of fattening affects the hardness of the fat, and this in turn has an important bearing on rancidity. At a given age and weight certain types of pig will be fatter than others. The effect of breed type on these points can be illustrated by a brief consideration of what is involved in the development and maturity of the pig.

Bacon Cuts. A whole side of bacon cut in what is known commercially as "Wiltshire Cut" style will provide the best illustration. This represents the maximum portion of the carcass that can provide cured bacon and ham. The parts which have been cut and trimmed off are therefore to be regarded as offals (literally "off falls"), usually referred to as secondary offals to distinguish them from the primary offals obtained at slaughter and largely consisting of internal organs.

If the cured side is then cut up into the usual retail cuts, these are divided into gammon or ham, middle and fore-end. These in turn are divided into smaller cuts whose composition is roughly as follows.

The *gammon* or *ham* contains a high proportion of lean meat composed of large round muscles. It is surrounded by a good proportion of fat, has very little connective tissue and except at the shank end has a small proportion of bone. In most respects it is the choice part of the carcass.

The *middle cut* varies in value. Along the back run the important dorsal muscles which provide a good "eye" of meat when the loin is cut through. The side of the pig, however, is thinner, and there is consequently a high proportion of ribs, skin and connective tissue to lean meat. There may also be too much fat deposited in it. The lower part of the middle, provided by the flank or belly of the pig, tends to be thin in young pigs. Only when it is thick is there a satisfactory proportion of lean meat. Fasting before slaughter results in an increase of up to 20 per cent, in the thickness of the belly.

The top of the *middle*, that is the back of the pig, while of fairly high quality, is less valuable than the ham because of extra bone, etc. The belly of the pig is not considered as valuable, particularly in the small unfinished pig.

The *fore-end* is not so easy to evaluate. The shoulder contains several large round muscles which provide a useful amount of lean. They can in fact be made into shoulder hams. Nevertheless there are more bones in the fore-end, and the blade bone in particular provides a serious problem in curing. In addition there are many small muscles in and leading to the neck which run in different directions, and which with their sheaths of connective tissue yield cuts of different grain and a high proportion of gristle. The sternum (breast bone) and connected cartilage also reduce the value of the fore-end.

To summarize, therefore, the most valuable parts of a pig are situated in the hind quarters and along the back, while the poorer parts are in the fore-end and along the belly.

Changes in Conformation. The next point to note is that as a young pig grows up a great change takes place in its conformation. The increase in size is what is mostly apparent, but with this goes a change in shape which is highly significant.

The young, newly born pig has a large proportion of its body in front of its shoulders. As it grows, the hind quarters increase in size, the head and shoulders become relatively lighter and the back lengthens. Accordingly, as a pig matures it changes from a poor meat conformation to a good one.

Coinciding with this change of conformation is one of composition. In the young pig a high proportion of the body is composed of bone, and further growth of the skeleton makes the major demand on the food of the animal. As size increases there comes a falling off in the rate at which the bones grow, while the growth of the muscles increases.

It is not till the bony framework and the lean meat of the muscles have been established that fat in any quantity begins to be deposited.

From consideration of the first of these points it would appear that, other things being equal, the older the pig the better its conformation. The second, however, suggests that a young pig will be bony and thin, a medium-aged pig will have the maximum proportion of lean meat and just the ideal amount of fat, while a mature pig will be too fat.

Variations in Nutrition. But other things are not always equal and one other factor has to be taken into account. The plane of nutrition, i.e., the quantity and quality of the food in relation to its requirements, has an important bearing in relation to the stage of maturity. In their early stages pigs need a high proportion of minerals and proteins in their diet. Later on the main requirement is for starchy foods. If at any stage the total amount of food is restricted or if the proportions of the essential ingredients are too low then the normal progress towards maturity is interfered with.

As the pig grows there are as we have seen three main waves of development. The earliest of these is a growth of the bones. If during that period the pig's feeding is restricted there may be reduced growth. At the same time there will be a tendency for most of the available food to be used in producing bony structure rather than muscle or fat.

The second wave of growth involves the muscles or lean meat. Unless the feeding of the animal during this phase is more than sufficient to build the muscular framework, little fat will be deposited. Even if the supply of food at this stage is very good, the tendency is for the body to reach the mature conformation rather than to put on too much fat.

The third wave is one of fat deposition. By the time this stage is reached there is very little capacity for the bones or muscle to make further growth, with the result that most of the food consumed leads to the production of fat. Pigs which have been poorly fed throughout their life tend to be small, with a high proportion of fore-end and head, and their carcass is mostly bone and lean meat.

Pigs fed very well from birth to slaughter have a high proportion of weight where the best cuts are placed, but over weights representing a carcass of about 8 score they are inclined to be fatter than the lean sizeable bacon of the shops.

Pigs fed well for the first part of their life, but kept on a reduced diet for the second part are well proportioned and full of lean, but have only a moderate covering of fat. Finally, when pigs are given a low rate of feeding in the early stages and are then fed well they develop small carcasses with heavy fore-ends and a great deal of fat.

Early and Late Maturing Types. Breeds and strains of pigs differ, among other things in the rate at which they pass through the various stages of development which culminate in maturity. Some pass through these stages rapidly and are referred to as early maturing breeds. Late maturing ones are those in which the process is slower. It is particularly important to appreciate that the rate of achieving maturity is quite different from the rate of growth. Early maturing pigs are nearly always smaller when mature than late maturing ones. Breed types which are large at maturity but late in reaching it, normally have a greater daily increase in weight than early maturing types.

The point to note, however, under war-time conditions, is that an early-maturing type of pig will not attain a given conformation until it reaches a heavier weight than usual if its feeding has been on a less generous plane than normal.

In the home utilization of a pig some people may want more fat, some more lean, and all will want a firm fat. A general knowledge of the characteristics of the different breed types likely to be met with is therefore of value. Many pigs in practice are first or second crosses between pure breeds and for this reason the breed type is discussed in general. Details of the different breeds will be found in other publications.

Breeds differ in the rate at which changes in the proportions and composition of the body occur. For example, the early maturing breeds such as the Middle White pass through these changes quickly so that, on peacetime feeding, they attain the conformation and composition suited for killing at 100 lb. live weight, whereas the later maturing breeds such as the Large White do not reach this same conformation and composition until they attain a weight of 200 lb.

PRINCIPLES OF FEEDING IN RELATION TO CURING

The effect of different planes of nutrition on conformation, and so indirectly on curing, has been dealt with in the preceding section. Before discussing in general the principles of feeding in relation to curing something further requires to be said about the texture of fat in the carcass and how this is affected by the way it is deposited.

The formation of fat is a method of storing excess food not required for growth, maintenance or energy.

Soft fat is strongly objectionable for several reasons. In addition to containing a high proportion of unsaturated fatty acids which tend to be oxidized to aldehydes and ketones and thus impart the acrid flavour associated with rancidity, it interferes with the appearance and firmness of the carcass, leads to difficulty in slicing and causes heavy loss in frying.

Producing Firm Body Fat. The fat in the body is, of course, made from feeding stuffs, but it may be produced either from actual fat ingredients in the feeding stuffs (food-fat), or from carbohydrate ingredients, or even from protein. It has to be noted, however, that the first call appears to be on the food-fat, after which the carbohydrates are utilized and finally the protein. Body-fat made from the food-fat will be essentially of the same nature. Body-fat made from carbohydrates is always relatively hard, that is to say saturated. It is important to note that the food-fat in the great majority of feeding stuffs given to pigs is softer, i.e., more unsaturated, than is required for good bacon fat. From this it follows that if there is sufficient food fat in the ration to produce all the body-fat, it is almost certain that this will be soft in nature. If, on the other hand, the food-fat is insufficient, then the remaining body-fat has to be synthesized from carbohydrates. Body-fat produced partly from food-fat and partly from starchy foods may be reasonably firm if the fat made from carbohydrate predominates. There are, therefore, two causes of soft body-fat. In the first case it may arise from the fact that the food-fat is so very soft that even when added to fat made from carbohydrate the resultant body-fat is less firm than required. Secondly, the ratio of the body-fat made from food-fat may be too high in proportion to what is made from starch.

It can now be understood why the fat of immature and of thriftless pigs is always softer than that of thriving and mature stock. When the pig is young the growth of both skeleton and muscles is rapid, while fat deposition is relatively small in amount. One of the typical symptoms of a thriftless pig is, of course, that it does not put on much fat. In both cases the food-fat accordingly forms a large proportion of the body-fat. In more mature stock, on the other hand, a stage is reached where much fat has to be manufactured and the proportion made from carbohydrates is, therefore, high. Anything which tends to reduce the rate of growth, for example, bad weather conditions in winter, will also tend to produce soft fat.

It follows that at any given weight the body-fat from an early-maturing type will be firmer than that from a late-maturing type, provided the feeding is the same, while the hardness of body-fat can be affected by the degree of saturation of the food fat. Pigs fed on a high concentration of coconut oil (a hard fat) showed a marked increase in firmness of the fat. When, on the contrary, linseed oil, which is a highly unsaturated oil, was fed, the body-fat was shown to be softer and less saturated.

Quality of fat may, therefore, be obtained by using an early-maturing type of pig, by forcing a later-maturing type to mature as early as possible, by feeding only such food ingredients as have a very hard type of food-fat, or by feeding a food containing little or no fat, such as, for example, potatoes.

Feeding therefore has a bearing on curing, first because it affects the general conformation and secondly because it affects the quality of fat.

Relating Type to Feeding. In so far as conformation is concerned this is improved by high feeding only if the pig is of a late-maturing type. In the case both of fat and lean, however, all the evidence suggests that a high level of nutrition gives the better results. To keep an early-maturing type on a low plane of nutrition is not likely to give such good results either as regards lean or fat, though a satisfactory general conformation may be produced. Where quality only is considered, the best results will be obtained from a late-maturing type such as the Large White fed at as high a level as possible.

Where, as in war time, a high level of feeding is impossible the situation may have to be met by feeding an early-maturing type on a low level, but the possible sacrifice of quality should be realized and additional care given to the cure.

One possible method of advancing maturity without too great an expense of food is, of course, to see that the health and comfort of the pig are maintained at the highest possible level.

It will not normally be the function of persons giving instruction in curing to advise on the feeding and management of pigs. It is, however, clear that housing and attendance must be of the best, and that loss of condition from such things as parasites and minor ailments must be reduced to a minimum.

CARE AND MANAGEMENT IN RELATION TO CURING

Pigs for home curing must be killed during the winter months and so they will normally be farrowed from about December or January to May or June. Pigs farrowed in December have to pass through the most critical period of their life—weaning to about four months old—in conditions of bad weather and are liable to receive a set-back to their growth which may have adverse effects on curing. If farrowed about March or April the chances are that they may be as heavy the following Christmas as if born in December.

Housing. The housing of home-fed pigs is often primitive, and while this does not by itself involve bad conditions, they frequently follow. Good, not extravagant, housing is necessary, and in particular a warm and well drained floor. Too often insufficient litter is used. A warm bed has a potent influence in producing a well finished carcass.

Gilts and Hogs. Gilts, on account of coming in season, make more restless feeders than hogs, but for the same reason produce carcasses with thinner back fat, and thicker bellies due to the growth of mammary tissue.

Castration. Most pigs fed for home consumption will be “clean” pigs, that is young animals which have not been used for breeding. Male pigs are normally castrated before weaning, say at about six weeks old, though the operation may be delayed till they are 12 or even 16 weeks old. When castrated they

fatten more quickly and there is no risk of a strong flavour in the meat. Female pigs used commonly to be spayed, but the operation is a more dangerous one and is now seldom carried out.

Fat Sows. Nevertheless there are many instances in which the pig selected for home feeding is an old sow, or even occasionally a boar. When her litter has just been weaned from a sow she is usually very thin and has drawn heavily on her body reserve. A considerable amount of feeding will accordingly be required. On the other hand, once an old sow has begun to put on condition she will usually fatten very well. The meat will not be so tender as from a younger animal, but it will have more flavour.

Boars. If a boar is to be fed it should first be castrated, and this is a job for a qualified veterinary practitioner. The operation in a mature boar will cause a check to fattening which may be only temporary, but which may show its effect for as much as a month. Thereafter the "stag," as the animal is then known, will probably fatten well. The risk of taint in the meat will depend on the length of time between castration and slaughter as well as on the age of the pig and length of time he has been used for breeding.

Handling. In addition to the good housing, and freedom from parasites—internal and external—which enable a pig to obtain the comfort that ensures thriftiness, important factors are quiet handling and regular feeding. These are usually supplied by the private owner, but with co-operative pig clubs, it is unfortunately not uncommon to find a different attendant looking after the stock every few days. Some attendants have stock sense and some are without it. In any event the change over from one attendant to another is apt to have an unsettling influence on the pigs.

Quiet handling, regular feeding hours, absence of over-feeding and provision of a supply of clean drinking water are all essential to the steady growth towards maturity that is essential for satisfactory curing results.

SLAUGHTER

If slaughter is carried out on the premises of the pig owner it is strongly recommended that the operation, along with the dressing of the carcass, should be performed by a skilled butcher. The successful production of home cured meats depends on a chain of factors. In spite of the prominence given to the salting process, efficient slaughtering is one of the most important links. Even though the pig is dealt with by a professional slaughterer, it is important to understand what efficient slaughter involves as it may be possible to trace faulty curing results to errors at this stage.

The chief advantage of handling and slaughtering in the vicinity of the sty is that the animal is more "at home," and has not been subjected to the nervous and physical strain of transport and fresh surroundings. Against this there may be a slightly higher risk of contamination, though with reasonable care this should not arise.

Pre-slaughter Care. As with other animals dealt with by the butcher, pigs should be kept off their food for about 24 hours before slaughter and allowed all the water they will drink. Should an animal be particularly restless, it is desirable to allow a small quantity of food. A well rested and fasted animal

will give a better carcass as the muscle is in good condition and the blood stream will not be gorged with nutrient substances from the digestive system. It is also claimed that the intestinal wall of a fatigued animal is less resistant to the passage of bacteria. Under ordinary circumstances most of the contamination taking place in a slaughter-house is of intestinal origin and for this reason the intestinal content should be reduced to a minimum.

Stunning. Every care should be taken to avoid excitement and bruising at slaughter, and if necessary the animal should be secured by a loop over the upper jaw or a running noose around the lower part of the leg. The Slaughter of Animals Act, 1933, applies only to animals slaughtered in a slaughter-house. This Act requires that all pigs slaughtered in a slaughter-house where a supply of electrical energy is available, or can reasonably be made available, must be mechanically slaughtered.

It is generally agreed that the most effective bleeding is obtained when the heart and respiratory organs remain in action for a reasonable period, and these functions depend upon the intactness of that part of the brain known as the medulla oblongata.

Various methods of inducing insensibility are in vogue. The Electrolethaler, as its name implies, is an electrical device using a high frequency current with a comparatively low voltage, usually 60 to 80 v. Tongs are applied behind the ears for five to ten seconds, the electrodes being kept moist by dipping in a 20 per cent. saline solution. If the pig is not stuck, it will recover in two to three minutes. With pistols using a free bullet, there is a certain amount of risk, particularly when working in a confined space. Captive bolt pistols, in which a bolt projects from the muzzle, are efficient and safe to handle. With this type of gun the muzzle should be applied about half an inch above the level of the eyes, half way across the forehead, directing the gun well up into the head. The nose should be subsequently cut parallel to, and about 1 in. behind the snout, so that any free blood will drain away from the head. For pigs of ten score upwards, two-grain cartridges should be used. After shooting it is essential that the pig should be stuck immediately before the reflex movements commence. This will ensure satisfactory bleeding. At one time a maul, consisting of a hard wood ball on an ash shaft was extensively used for stunning and this method did little or no damage to the brain.

Sticking. Blood provides an ideal medium for the growth and multiplication of putrefactive organisms and it supplies a vehicle for their distribution throughout the animal. Thorough bleeding, therefore, has a profound influence on the commercial keeping life of a carcass.

A sticking knife 6 to 8 in. long, preferably sharpened on both sides of the point, should be employed. The animal can be laid on its back, head extended, or some prefer to lay the animal on its side. The knife should be inserted just in front of the breast bone, at an angle of about 45 degrees and an incision made downwards to a depth of about 4 to 5 in., carrying the knife down to the backbone, and drawing towards the jaw. This cut must be made on the middle line of the pig. The first pair of ribs are fairly close together and any deviation of the knife may result in "shoulder sticking." In "shoulder stuck" meat the blood will not drain properly from the flesh and such meat

will not cure properly. If correctly carried out the carotid and internal pectoral arteries will be severed. Sticking is a highly skilled operation and it is probable that an inexperienced person would obtain better bleeding by cutting across the throat than by risking faulty sticking.

Bleeding. Bleeding must be thorough, and in some cases it may be advisable to raise the hind end of the pig to assist the flow. Most commercial houses allow a bleeding period of at least six minutes, *with the pig hoisted*. If blood is intended for sausage, it must be stirred immediately and all the "strings" removed.

Dehairing. The hair must be removed from the skin at slaughter either by scalding or singeing. In scalding, the ideal temperature for the water is between 145°-150° F. Under farm conditions it may be difficult to maintain this range, and initial temperatures of about 180° F. may be met with. It is probably better to have the water approaching boiling point and to adjust the temperature by adding cold. Needless to say, an *accurate* thermometer has a great advantage as compared with the more homely methods of dipping in the fingers three successive times, or placing a drop of blood in the water.

With hard water it is sometimes advisable to add a small cupful of soft soap, to assist in removing any grease and dirt. With coarse haired pigs it is a good plan to place a few handfuls of sawdust in the water to give a certain amount of grip when dehairing.

Singeing under home conditions is carried out by covering the pig with clean, dry straw and lighting it from the windward side, then reversing the pig to singe the other side. Too fierce a flame will blister the skin. This process is followed by a thorough washing down with a stiff broom and scraping.

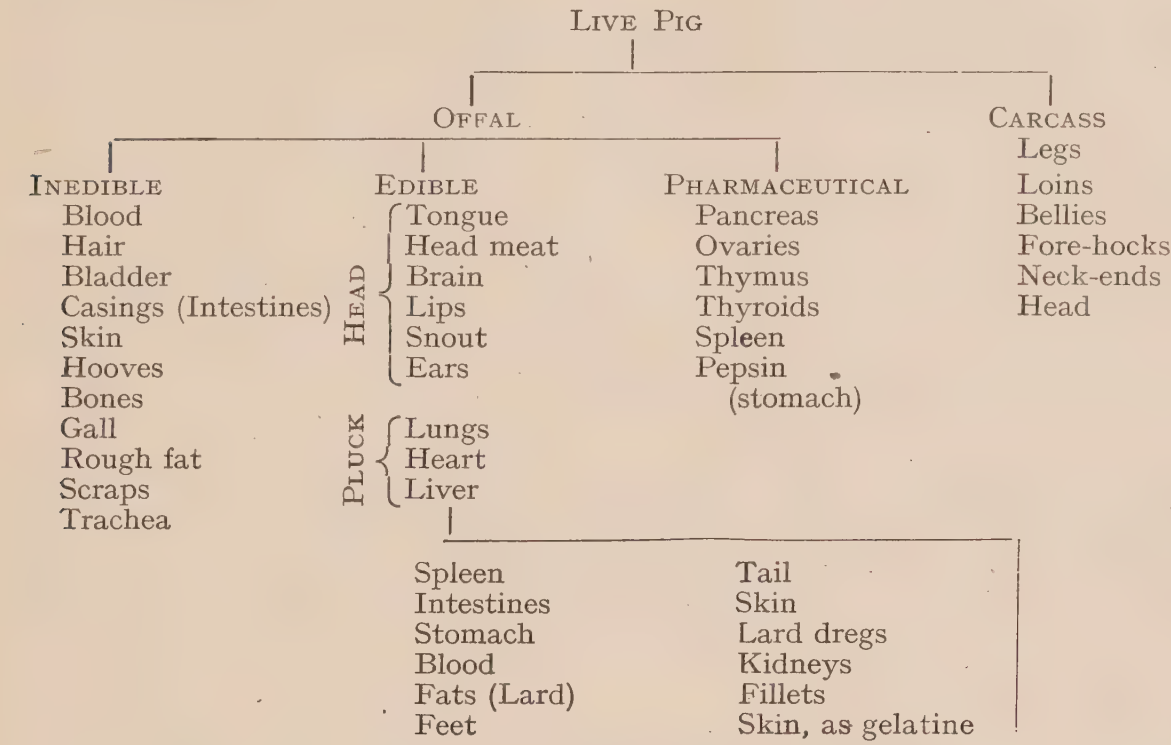
Hoisting. The tendons of the hind legs are exposed by making a cut down the back of the foot. There are two tendons that should be raised, particularly in heavy carcasses. The gambrel or a strong stick is inserted and the carcass can be hung from a beam, tree, or from a ladder, firmly placed. Any dirt remaining on the carcass can then be removed by washing and scraping.

Evisceration. There are many local variations in the methods employed, but the following outline indicates the general procedure. The carcass is opened by making an incision through the middle line from just below the hind legs to the throat. When making this cut, two fingers should be inserted, one on either side of the knife, to prevent puncturing of the intestines. The rectum is loosened and the stomach and intestines carefully pulled out. The skirt is cut through and the pluck removed, in some instances the tongue being left attached to the pluck. The gall bag must be carefully trimmed from the liver. In mild weather it is advisable to open up the lobes of the liver by inserting a skewer. The flare fat and kidneys can be removed while the carcass is hot. This will accelerate cooling.

Splitting. The carcass may be divided by chopping or sawing down the centre after having divided the aitches. The head may be left on one side, or it may be divided. Alternatively, it is customary in some areas to cut on either side of the spinal processes to give a wide chine. Small and medium sized

carcasses are usually allowed to cool for 12 to 24 hours before splitting. Cooling of large carcasses, especially if the weather is not very cold, is accelerated by splitting on the day of slaughter.

The products obtained from the slaughter of a pig may be shown in the following tabular form.



INSPECTION OF OFFALS AND CARCASS

Although the legal requirements, Public Health (Meat) Regulations, 1924, apply only where *meat is offered for sale or intended for sale for human consumption*, it is strongly recommended that the carcass and organs of pigs killed for home consumption should be examined by a qualified Meat Inspector to ensure that they are fit for human consumption.

As regards pigs killed on the owner's premises, however, this may not be possible and it is desirable that persons handling such products should be familiar with the appearance of normal and healthy tissues. This knowledge can only be acquired by experience and observation, but the following brief outline may provide a guide as to the main points to look for.

Diseased Glands. THE LYMPHATIC SYSTEM (*see* Fig. 4). This system ramifies throughout the body, somewhat like veins, and at intervals there are enlargements which are termed lymphatic glands. These are referred to by the butcher as " kernels ". They can be considered as filters which attempt to prevent bacteria, etc., from penetrating further into the animal body. Most people are familiar with a swollen gland under the arm-pit arising from a poisoned hand, or a sore throat causing an enlargement of those in the neck. Thus the meat inspector can usually find evidence of disease in an enlarged, discoloured gland, more easily than in the tissues which have been primarily infected. A knowledge of the position and normal appearance of these glands is therefore of utmost importance in meat inspection. Their size varies considerably,

some of them being as small as a millet seed while others may be as large as a walnut. The outer wall of the gland consists of a strong fibrous coat, and in the gland proper, two regions can be recognized: an inner portion somewhat pink in colour, and a lighter outer part. Some of them, particularly those of the offal, may have a somewhat greyish colour. As mentioned above, these glands acting as a filter, attempt to keep germs out of the general circulation. They are, however, very sensitive, and are found to be inflamed should there be inflammation in the region they drain. In the case of tuberculosis, the changes that take place in infected glands may be observed in one of the following forms: (i) Swelling, (ii) Small cloudy spots, (iii) Formation of larger tubercles, (iv) Caseation (cheesy formation), (v) Calcification (gritty formation). In the pig, tuberculosis is generally contracted by ingestion, and consequently the digestive system and its glands will usually be involved. Should the disease become generalized, the lungs, liver, spleen and kidneys are usually affected. The bones, especially those of the vertebrae, may show signs of tuberculosis.

Incomplete Bleeding. Meat from animals incompletely bled is easily attacked by bacteria and will present an abnormal appearance. Apart from indicating faulty slaughter incomplete bleeding is also a sign of serious illness, fatigue and sudden internal bleeding. In such cases the cause should be sought so that the carcass can be judged according to the real trouble.

Abnormal Odours. Uncastrated adult boars will sometimes yield a carcass possessing a repulsive smell. Various herbs and drugs can give rise to taints affecting the flesh. Feeding with oily fish meal up to the time of slaughter has been known to cause fishy taste in the meat. Even after the death of the animal the fatty tissue in the flesh may become contaminated by the absorption of fat-soluble flavours, paint, fruit and fish odours being readily taken up. In cases of doubt a sample should be taken approximately 24 hours after slaughter, and placed in a closed vessel in cold water. This should be brought to the boil and the vapour smelt and the meat and stock tasted.

Dead Animals. Should a dead animal be butchered with the object of making it appear slaughtered, the fact can be recognized by the presence of blood in the blood vessels and viscera, particularly the liver. The tissues are moist, and putrefaction will occur both internally and externally.

Fevered Flesh. This condition is caused by bacterial toxins and by defective bleeding. It is one of the signs of seriously diseased conditions present immediately before slaughter. The carcass sets badly, small haemorrhages may be present and in bad cases the flesh may be slimy to the touch.

Routine Inspections. In these inspections the following procedure is generally employed in the examination of pigs.

LUNGS AND TRACHEA. The substance is examined by palpation, the lymphatic gland incised and the lung tissue cut across. The lungs should be light pink in colour, possess a smooth glistening surface and throughout should feel elastic and spongy to the touch. There should be little blood present and, though collapsed, the lungs should float on water.

HEART. This is usually cut across to examine the muscle substance. The tissues should be less firm than those of the sheep's heart, but reasonably firm, and should not contain an excess of blood.

LIVER. The lobes should be opened out and tested by feeling and visual examination, and the glands on the under surface cut into. The colour can vary considerably, and frequently it may be enlarged and possess a yellowish-brown colour owing to fatty infiltration, but unless excessive this does not render it inedible.

MESENTERIC FAT (Gut fat). This fat contains a very large number of glands, running in chains, and these should be opened and thoroughly examined.

SPLEEN (Melt or Milt). This is examined with all the other abdominal viscera.

CARCASS. The serous membranes lining the abdominal cavity and the chest wall are very carefully examined and the glands of the throat incised. In all suspicious cases all the lymphatic glands should be examined, the pig being split down so that the vertebral column is exposed and so that the kidneys can be more easily detached for examination. Fig. 4 indicates the approximate position of the more important glands.

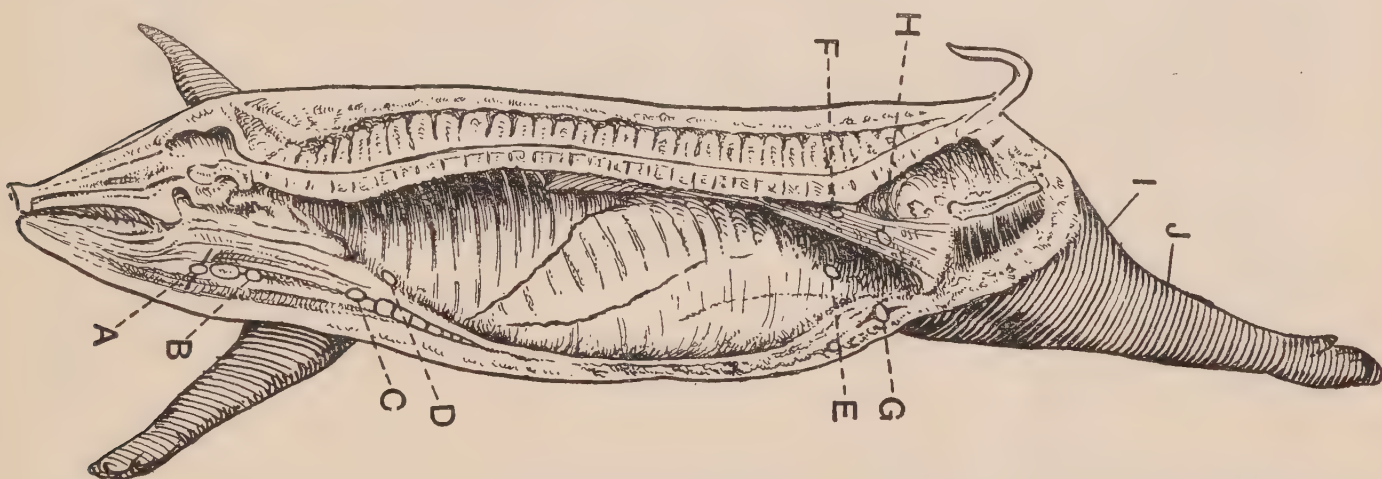


FIG. 4.—Location of the Main Lymphatic Glands

- A. Submaxillary. B. Anterior or Upper Cervical.
C. Superficial and Deep Prepectoral. D. Suprasternal. E. Preaxillary.
F. and H. Internal Iliac. G. Superficial Inguinal. I. Popliteal.
J. Hock. (From *Food Inspection* by Macewen.)

METHODS OF CUTTING

When the pig has been slaughtered and the carcass has been dressed by the removal of the various organs, etc., which form the primary offals, the curer finds himself in possession of the whole carcass or of two sides. These must first of all be further dressed to remove all the secondary offals which will be dealt with fresh or lightly pickled. The dressed side which remains may be cured all in one piece, as is done in the Wiltshire factory style, or it may be cut into various smaller pieces before curing.

The Art of Cutting. The cutting of carcasses is a specialized and difficult operation, the art of which lies largely in having sufficient practical anatomical knowledge to recognize where the bones, and

particularly the joints, are to be found under the meat. A skilled cutter will use his knife to reach the exact part of bone or joint that he is seeking. He will then use a chopper or saw to cut the bone and a knife to sever joints. Skill also lies in making a clean cut with a single, smooth surface. The hesitant cutter will leave a rough and fissured surface that greatly increases the risk of bacterial infection.

Methods of cutting will vary considerably in different parts of the country. Associated with these variations may be slight variations in salting methods, but these are not of outstanding importance. The fundamental points to note about cutting are two.

The more the side is cut into different pieces and the greater the extent to which boning is carried out, the greater is the surface exposed to infection.

Conversely, the more the carcass is divided into cuts of even thickness and composition the easier it is to control the curing of each cut.

Local tradition attaches much, usually too much, importance to methods of cutting. The exact method employed should be one which best meets the existing circumstances. Opposition may be experienced when a local butcher is asked to cut meat in a different way from usual. So long as there is a sound reason for any particular method there is nothing to fear from adopting it. On the other hand, if an expert butcher is available who can handle the meat skilfully with a minimum of waste it may be wiser to adapt the curing procedure to the local cuts which he supplies.

Where it is not possible to obtain the services of a skilled man, it is usually desirable to divide the side into pieces by straight lines rather than to attempt jointing according to anatomy. If this is done it is better to cut straight down to the first bone to be encountered and then to saw through this rather than use a chopper.

Removing Secondary Offals. In all cases the kidneys, flare fat, trotters and vertebrae are removed, and usually the sternum as well. The blade bone is often extracted, but as this is probably the most difficult of all cutting operations it may be wiser to decide on a schedule for utilizing the whole pig which involves the consumption of that part of the carcass containing the blade bone either as fresh or pickled meat or as lightly cured bacon. The aitch bone may, or may not, be taken out depending on the type of ham required.

The portion of the skirt (diaphragm) attached to the carcass is cut away; also the blood vessels in the neck. In the case of rolled bacon all the bones are of course removed. Occasionally some of the rib bones may be sliced off with a fair quantity of meat attached to them, while in some areas the back bone is taken out, together with about one or two inches of the fat and flesh on either side.

If, after the side has had the secondary offals cut away to prepare it for curing, it is further divided into cuts, these may be made in a number of ways. The following diagrams and tables will indicate some of the commoner methods which may be encountered.

Typical Cuts. Diagram 1 in Fig. 5 indicates the method recommended for the graduated cure (except that the aitch bone has been removed) and with a saw, sharp knife and a reasonable amount of skill, the resultant jointing should be quite satisfactory. The weights throughout are based on a 60 lb. side such as might be obtained from a pig of 200 lb. live weight.

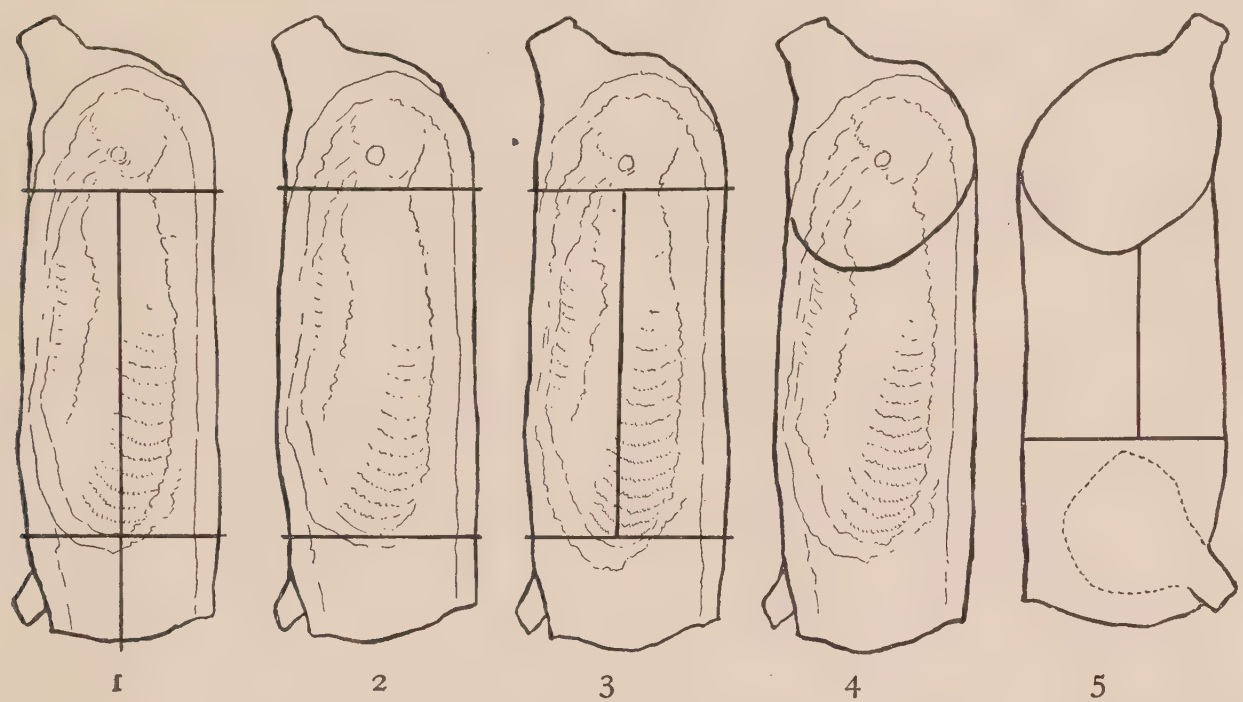


FIG. 5.—Typical Methods of Cutting a Side.

1.				2.			
		APPROX. WEIGHT	APPROX. PERCENTAGE			APPROX. WEIGHT	APPROX. PERCENTAGE
		lb.	OF SIDE			lb.	OF SIDE
Gammon	...	15	25	Gammon	...	15	25
Loin	...	17	28.5	Middle	...	28	46.5
Belly	...	11	18	Fore-end	...	17	28.5
Collar	...	8	13.5				
Fore-hock	...	9	15				
		60	100			60	100
3.				4.			
Gammon	...	15	25	Ham	...	17	28.5
Loin	...	17	28.5	Spencer or			
Belly	...	11	18	Jacket	...	43	71.5
Fore-end	...	17	28.5				
		60	100			60	100
5.							
		APPROX. WEIGHT	APPROX. PERCENTAGE				
		lb.	OF SIDE				
Ham	...	15	25				
Loin	...	14 $\frac{3}{4}$	24.5				
Belly	...	10	16.5				
Neck (Sticking		9 $\frac{1}{2}$	16				
Piece in Devon)							
Shoulder	...	10 $\frac{3}{4}$	18				
		60	100				

PREMISES, EQUIPMENT AND UTENSILS FOR HOME CURING

Premises. Success in home curing is largely governed by the extent to which unspecialized premises are adapted to provide the requisite conditions.

The ideal *curing room* is one with an even temperature between 38° and 50° F., and preferably with a north aspect. It should have a free circulation of fresh cool air, entering from screened and if possible hooded, apertures. The room should possess means of darkening, as light affects adversely the fat of the meat. A stone flagged or cement floor is desirable, and there should be adequate means of excluding rats, mice, cats and flies. Most cellars, though even in temperature, are too damp, but not for mild dry salting. A maximum-minimum thermometer is a most useful guide to temperature conditions and the making of a chart of temperatures during the curing period is strongly recommended.

For *drying*, the best room is one which will maintain a temperature of about 60° F., preferably with a current of air. The ceiling of a large kitchen furthest from the fire or a passage way leading from the kitchen is useful. Rooms in which there is a hot-water tank may occasionally be used provided the meat is not too near the source of heat. Rooms heated by controlled steam heating can be used, and electrically heated rooms are even better as they are usually drier and the temperature is constant.

For *storage* the essentials are absence of light and steady though not necessarily low, temperature. Most attics are insufficiently insulated and so, apart from the risk of being too hot in summer, there will probably be large variations in temperature. These may lead to condensation on the surface of the bacon, and this dampness is responsible in time for slime production and other evils. Cellars though of even temperature are often too damp or lacking in adequate air circulation. A good larder or unheated ground floor facing north is as good as any other.

Equipment and Utensils. The equipment for home curing need not be elaborate (see Fig. 16) but should include the following:—

- (1) a tenon saw
- (2) a boning knife
- (3) a larger (steak knife) and steel
- (4) scales for weighing the meat and preparing the curing mixtures
- (5) a strong table 5 ft. × 2 ft. 6 in. for cutting
- (6) a hand mincing machine with fine and coarse plates and filler if sausage is being made from trimmings
- (7) a large basin or tub for brining the head and trotters
- (8) curing trough, shelf or floor, depending on the type of cure
- (9) thermometer
- (10) large basin or tub

While households may possess many of the articles mentioned, it should be realised that, under war-time conditions, new stocks are difficult to obtain. This applies particularly to scales and hand mincing machines which are now virtually unobtainable.

For some items substitution could be arranged from existing domestic supplies, e.g., an ordinary carving knife might replace the steak knife, and boning might be effected with a narrow-pointed kitchen knife. Equipment which cannot be purchased may perhaps be borrowed.

If dry salting is being undertaken a stone or brick floor or slate shelf will be required. If a "box" cure is contemplated a strong box or barrel with pieces of wood and weights for keeping the salt firmly pressed down are

necessary. For pickle curing, tubs or barrels are suitable. It must be remembered that the meat will float in the pickle, and boards with weights (e.g., large, clean stones) must be provided, as a cover.

If a combination of the dry and pickle cures is employed, for instance the basting method, a stone or lead trough is ideal. Preferably there should be a plug hole at the bottom for drawing off the liquor for basting. Wooden troughs are sometimes used, and these may be improved by impregnating them with melted paraffin wax, which, on setting, gives a clean waterproof surface. If a trough is used it is usually sloped by having one pair of longer legs, or one end is propped up. The hams and shoulders are usually kept at the lower end where the pickle collects, as they need more time in cure because of their thickness. If troughs are not available basins and large platters may be employed.

When the meat is being dried meat hooks and strong twine will be required and, for storage, greaseproof paper and clean muslin or calico. If the meat is being stored in meal, oat hulls or lime, then bins or boxes will be necessary.

PRINCIPLES OF PRESERVATION BY CURING

Animal Tissues: Composition and Structure. The body of an animal consists of a number of different tissues. Some of these, with their contents, are known as organs, e.g., the heart, lungs, stomach, intestines and kidneys. Others compose the framework of the body, and it is mostly these which, in the pig, form the fresh pork or provide the meat to be cured into bacon and hams.

Without going into a scientific description of all the animal tissues as defined by the histologist, it will be sufficient from a practical point of view to assume that the essential tissues in a pig carcass may be roughly divided into five: muscle (lean meat), fat, connective tissue, skin, bone. In addition, often running through the others, there are tissues which are less important from the meat point of view, such as blood vessels, nerves and glands.

Connective tissue is so named because it is used for binding and connecting other tissues. Strictly speaking it is the basis of other tissues such as bone, fatty tissue, etc., but it may be simpler to consider it here as referring to membranes, ligaments, etc., of which typical examples are seen in the sheaths of muscles, the skretchings from which lard has been rendered, and the mesentery which holds up the intestines in the abdomen.

Lean meat consists of large numbers of muscle fibres, usually bound together into bundles of varying size by an encircling sheath of connective tissue. The purely muscular tissue in lean meat contains approximately 78 per cent. of water, but practically all lean meat contains variable amounts of fat. That part of muscular tissue which is not water consists essentially of proteins, some of which are in solution.

The *fat* in a carcass is composed of connective tissue in which fat is deposited to a greater or lesser degree. Sometimes the tissue is a purely fatty one, e.g., the leaf fat or flare in a pig consists only of connective tissue and fat. Other fat gets deposited in close association with different tissues, as when it is deposited in the connective tissue between the muscle fibre bundles. In the live animal fat is in a liquid state and is an amorphous substance. When

solidified in the cooled carcass it can be melted out of fatty tissues, leaving behind the connective tissue which held it. The fatter the animal the larger the proportion of fat contained in the fatty tissue.

The *skin* consists of several layers of tissue, and while these approximate to protein tissues in their composition they are normally tough and indigestible. On boiling, skin yields varying amounts of gelatine.

Bone consists of a foundation of cartilage. This is a form of connective tissue which is tough but otherwise similar in composition to protein tissues. In the cartilage a combined carbonate and phosphate of lime becomes deposited, and with age the calcification proceeds so far that the bone becomes quite hard. The long bones are hollow and are filled with marrow, which is a compound substance containing, among other things, fat.

Through and over these main tissues runs a network of blood vessels, ranging from large arteries and veins to very minute capillary blood vessels. By this means every part of the body is in close contact with blood which carries food substances and oxygen to the tissues, and removes from them the waste products produced by living tissues.

Post Mortem Changes. When the pig is slaughtered important changes take place in the tissues. If it has been well bled the blood vessels and all the tissues which they supply will be largely drained of blood. This reduces the probability of infection of the tissues by bacteria which grow on dead tissue and can spread quickly through the blood to all parts of the body.

GLYCOGEN SUPPLY. The most important change takes place in the muscles. During life these contain a substance known as glycogen, which is a special form of starch found in animals. It serves as a store of energy for the muscles. When the live animal uses a muscle to move a limb or to maintain balance its glycogen is used and turned into lactic acid. Normally the glycogen gets replaced again from sugar in the blood, and the lactic acid is dealt with by the circulatory and excretory systems.

When a muscle has temporarily reduced its supply of glycogen it becomes fatigued and remains in this condition until its reserve is made up again.

The recovery of the glycogen reserve is rapid in muscles which are mainly used to maintain the posture of the animal. Typical of these are the muscles of the back which form the "eye" of meat. On the other hand recovery is very slow in the case of the fillet and of limb muscles such as those in the shoulder and the lower parts of the legs. Bone taint, associated with poor glycogen content of the muscles, is most common in the knee and shoulder. The fillet is usually eaten as fresh meat.

When the animal is killed all the glycogen remaining in a muscle changes into lactic acid. If slaughter takes place when the pig is rested there will be a good supply of glycogen in all the muscles and so there will be a large amount of lactic acid formed in all the lean meat after death. If, on the other hand, the pig is fatigued at the time when it is killed there will only be a small amount of lactic acid formed in the limb muscles.

The amount of lactic acid in the muscles has an important effect on their condition as it affects curing. In the presence of lactic acid the spaces between the individual muscle fibres increase and the texture of the muscle becomes "open." If sufficient lactic acid is not

developed the structure may not open up properly and a closer muscle structure may result. As the rate at which salt penetrates depends on the muscle structure, penetration is speedier when the condition is open.

The production of lactic acid has a further effect. The growth rate of bacteria in dead muscular tissue depends upon its acidity. Most bacteria grow freely in neutral or slightly alkaline media. In an acid medium they grow much less rapidly. Apart from the rate at which salt can penetrate, therefore, there will be a slower growth of bacteria in meat from a well rested pig than from a fatigued one.

COOLING. In addition to fatigue, the rate at which the carcass is cooled after slaughter has an effect on the post mortem changes. If the carcass is cooled too rapidly the changes in the dead muscles are slowed down and the open structure does not develop as rapidly as is desirable. For example, the change to the open condition at freezing point, 32° F., might take about a fortnight, but at room temperature, say 50° F., it should be complete in about 24 hours. On the other hand, if the meat is actually frozen—and its freezing point is slightly below that of water—ice will form between the fibres, the structure will become too open and curing will be abnormal.

Whilst the changes—mostly of a putrefactive kind—caused by bacteria are the most important which concern lean meat, i.e., muscle and connective tissue, it must be realized that the extent to which bacterial attack affects fat is of minor importance. They may attack the connective tissue supporting it, but the changes which affect the pure fat are chemical rather than bacteriological. The composition of animal fat varies according to the proportions of different kinds of fat in the food at different times, and thus it may contain larger or smaller proportions of hard or soft fats. Fats and oils are similar in composition and vary only in their physical condition.

RANCIDITY. On exposure to air, animal fats tend to take up oxygen, and this process of oxidation produces first of all peroxides and finally aldehydes and ketones which are responsible for the acrid flavour characteristic of rancidity. Soft fats and oils being chemically more unsaturated, that is, having a greater tendency to combine with such things as oxygen than hard fat, react more rapidly, and so more quickly become rancid. In pig meat the later stages are shown by a change of colour in the fat from white to yellow.

Rancidity develops more rapidly in the presence of light and particularly when the temperature of the fat becomes too high. Even in the case of firm fats, kept under dark and cool conditions, there is an inevitable tendency to become slightly rancid, and as the condition is not brought about by bacteria the method or efficiency of curing is not responsible for it. Fish oils in the food tend to be deposited unchanged in the body fat and as they are usually highly unsaturated they should, in spite of their great value as a protective food, be used with great care and avoided altogether in the later stages of feeding for home curing.

Methods of Preservation. From the discussion of the changes which take place in the tissues after slaughter it follows that methods of preservation must be such as will prevent the growth of destructive bacteria and moulds and reduce the onset of rancidity to a minimum.

To avoid rancidity it is important to pay attention to the feeding and thriftiness of the pig before it is killed, but after slaughter the essentials are to keep the meat cool and away from light.

The more serious problem is to prevent putrefactive bacteria developing in the muscles and connective tissue. All the methods, old and new, are based on removing substances (such as water) in which these organisms can grow or in providing other conditions such as the presence of salt or other preservative, in which they cannot.

DRYING. Putrefactive bacteria require for their growth water, and a suitable temperature. Some of them (anaerobes) which can only live in the absence of oxygen, give rise to internal taints, usually near the bone. In fresh pork, surface taint may be caused by those which live in the presence of oxygen (aerobes) or by facultative anaerobes, (i.e., those which normally live in the absence of oxygen but can tolerate its presence to some extent). They cannot develop in dry substances and in the absence of sufficient supplies of moisture their development is slow. For this reason one of the oldest methods of preserving meat is to dry it. Pemmican, biltong and dried fish are typical examples of this method. Modern methods have been developed for removing moisture without destroying the normal properties of meat.

TEMPERATURE CONTROL. *Low Temperature.*—Low temperatures slow down the growth of bacteria, but do not kill them. Meat may be preserved by keeping it frozen.

High Temperature.—Exposure to high temperatures will destroy bacteria, but the requisite temperatures are so high that the meat is cooked and unless then dried or kept at a low temperature it will again become infected with bacteria and moulds. Sometimes the temperature of boiling water is not high enough to destroy germs, in which event higher temperatures can be obtained by resorting to cooking under steam pressure.

CHEMICAL CONTROL. *Gas Storage.*—As the majority of bacteria which concern fresh meat preservation are aerobic, meat may have its storage life increased if stored in an atmosphere of 20 per cent. carbon dioxide.

Preservatives.—Bacteria in meat may be killed or their growth inhibited by the application of what may be loosely termed preservatives. These in effect are poisons which if not present in too high a concentration can be tolerated by human beings eating the meat. The Public Health (Preservatives, etc., in Food) Regulations, 1925, define preservative as “any substance capable of inhibiting, retarding or arresting the process of fermentation, acidification or other decomposition of food, or of masking any of the evidences of putrefaction; but does not include common salt (sodium chloride) saltpetre (sodium or potassium nitrate), sugars, acetic acid or vinegar, alcohol or potable spirits, herbs, hop extracts, spices, and essential oils used for flavouring purposes, or any substances added to food by the process of curing known as smoking.” Since these regulations were passed the use of nitrite has been legalized by Statutory Rules and Orders, No. 633, dated 30 April, 1940. Under this the presence is permitted of added sodium or potassium nitrite in bacon or ham. In the case of any cooked pickled meat, other than bacon or ham, offered for sale the presence is permitted of added sodium or potassium nitrite in proportions not exceeding 200 parts per million calculated as sodium nitrite.

Typical preservatives include sulphur dioxide or sulphites, benzoic acid, boric acid and their compounds as well as sodium or potassium nitrite and

formaldehyde. With the exception of sulphur dioxide, which may be used with sausage meat (in the form of sulphites) in concentrations not exceeding 450 parts in one million (this only applies to England and Wales), preservatives may not be added to food for sale.

Curing Ingredients.—The preservation of meat by curing consists partly in drying the meat and partly in getting into solution in the meat fluids a sufficiently high concentration of salt and saltpetre (sometimes with sugar as well). Salt is the really essential ingredient in curing, which could not be carried out in its absence, though meat could be cured with salt alone. Between preservatives and curing ingredients no hard and fast line can be drawn. Saltpetre is not a substance required for human nutrition, and except in small concentrations could be regarded as an irritant or weak poison like many preservatives.

Common salt differs in being a necessary ingredient of human diets, yet in high concentrations it can become an irritant or even a poison. Sugar has none of the objectionable qualities of the other preservatives.

Curing ingredients also include vinegar (mostly acetic acid), pepper (the essential oil probably has a preservative effect) beers, wines and spirits (alcohol being the preservative agent) and wood smoke in which are found formaldehyde, alcohols, tars, creosote, etc.

Fruits, berries, spices, etc., have practically no preservative effect, apart from some of the acids or essential oils contained in them, and their main function is to add flavour to the cured product.

Salt.—Chemically salt is sodium chloride and is available commercially in a number of forms.

Bay salt, obtained by evaporating brine in large shallow open pans, is a coarse hard crystalline form containing moisture. Common salt is also obtained by the open pan method but is a finer crystal, the size being determined by conditions of evaporation. Bar salt is made by ladling the salt from the pan at a high temperature and packing it while still hot into smaller wooden moulds, then drying the casts in a hot house or stove. If bar salt is crushed and sieved at a factory it is known as dairy salt. Thus bay, common, bar and dairy salt are identical chemically and contain about 98.5 per cent. sodium chloride. The main impurity is calcium sulphate which is insoluble in water. It reacts with the potassium phosphate extracted from the meat during curing, to produce calcium phosphate which is insoluble in water and tends to give a cloudy brine. To some extent the calcium phosphate retards the rate of penetration of brine into the meat by choking up the tissues, but as the amount of calcium sulphate contained in salt is not large this matter is not of great practical importance. The second impurity, magnesium salts, can be disregarded as it amounts to only 0.01 per cent. to 0.1 per cent.

Vacuum salt, which is chemically 99.9 per cent. sodium chloride, is obtained by evaporating brine in large, totally enclosed vessels under a vacuum. It resembles dairy salt but, apart from its purity, has one important difference, namely that it is composed of minute crystals perfectly cubical in shape. This gives vacuum salt different physical characteristics from dairy salt; it packs more closely, its density is higher and it is more free pouring. Vacuum salt

contains no calcium or magnesium salts but may contain a minute amount of sodium sulphate which does not affect curing. Table salt is made by adding to vacuum salt a small amount of magnesium or calcium salts to prevent caking but it is not desirable to introduce them into the cure.

From the purity point of view vacuum salt would seem to be the best to use for curing but many people prefer other grades because of their physical properties. For instance one cubic foot of common salt weighs approximately 48 lb., a cubic foot of dairy salt about 60 lb. and vacuum salt roughly 72 lb. The main point in curing is that salt must always be in contact with the meat. As long as it makes contact it does not matter which grade of salt is used, but the coarser the grade the less the area of contact with the meat. Bay salt sprinkled on the meat leads to a wetter cure because the larger separate crystals cannot absorb the surface liquid to the same extent as a layer of fine salt. Fine salt has, however, a disadvantage in that it tends to cake into a solid covering. As the meat shrinks by the loss of fluids, contact with the salt is lost, a space is formed in which bacteria may lodge and the surface of the meat tends to dry, thus making any subsequent salt penetration difficult. A mixture of fine and coarse salt helps to overcome this difficulty and is often used.

The question of dampness of salt has a bearing on dry curing. If a film of salt is spread out on a normal dampish day when the humidity is about 90 per cent., the salt will pick up about 1 per cent. to 2 per cent. of moisture per day. It is important then to use dry salt, particularly for the curing mixture.

If dry salt is applied to meat it passes into solution in the meat fluids near the surface. From there it passes inwards until the concentration of salt is approximately the same throughout the lean meat. Even in low concentrations salt interferes with the growth of objectionable bacteria, and in higher concentrations it largely inhibits their development, although it permits other bacteria which are either harmless or desirable to grow slowly.

If salt in solution, i.e., as a brine, is applied to meat it passes from the brine into the meat fluids. At the same time a little fluid passes into the brine.

If, on the contrary, dry salt is applied to meat, it first of all draws out to the surface some of the meat fluids in which it dissolves. From the surface the salt then penetrates into the meat, but most of the fluids become absorbed by surplus salt on the surface and either fall from the meat into the dish or on to the floor on which the meat is kept, or lie as a strong brine in pockets on the surface of the meat. Salt applied dry does not penetrate into the meat so rapidly as when applied as a brine. Dry salting removes more water from the meat than does immersion in brine.

The important factor in preventing the growth of undesirable bacteria is not the total amount of salt present, but its concentration in the meat fluids. Again, the less moisture there is in the meat the more bacterial growth will be inhibited. Dry curing removes a considerable amount of water from the meat and this drying effect is, by itself, an important factor in preservation.

On the other hand, some of the soluble proteins of the muscle tissues remain soluble in salt solutions while others are precipitated. When dry salt is applied

FIG. 6 (*on right*).—Cutting through Back Fat and Detaching Head from Left Side.

FIG. 7 (*below left*).—Sawing through the Centre of the Ba kbone.

FIG. 8 (*below right*).—Right Side with Whole Head; and Flare Fat with Kidney detached.

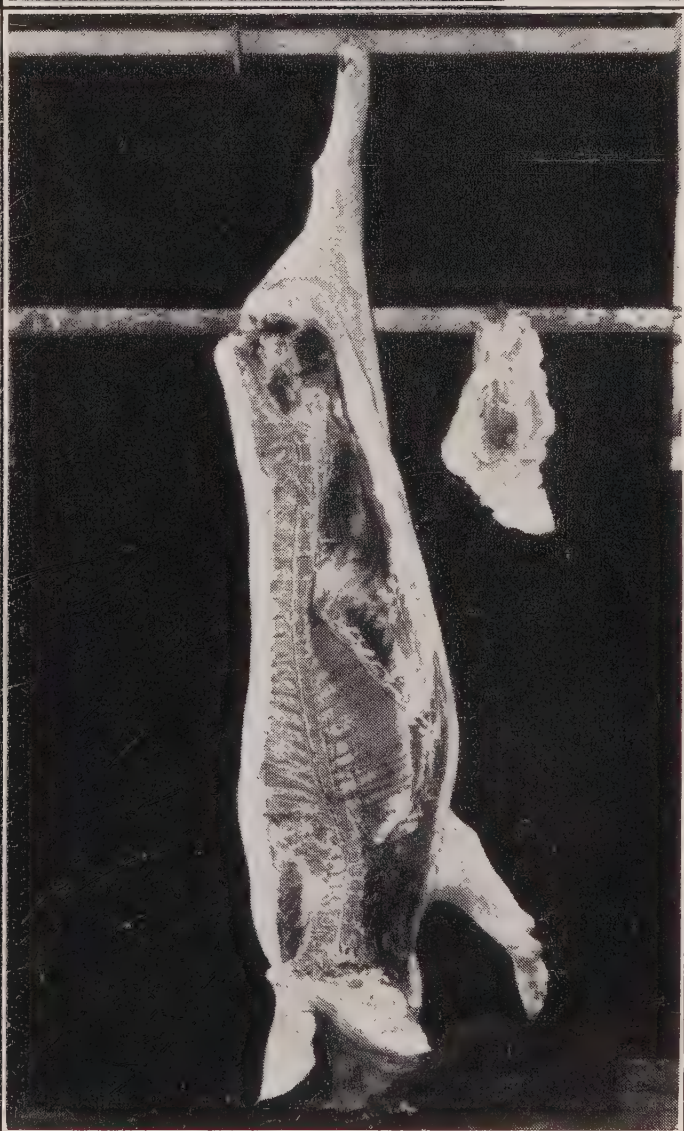


FIG. 9.—Removing the Ham.

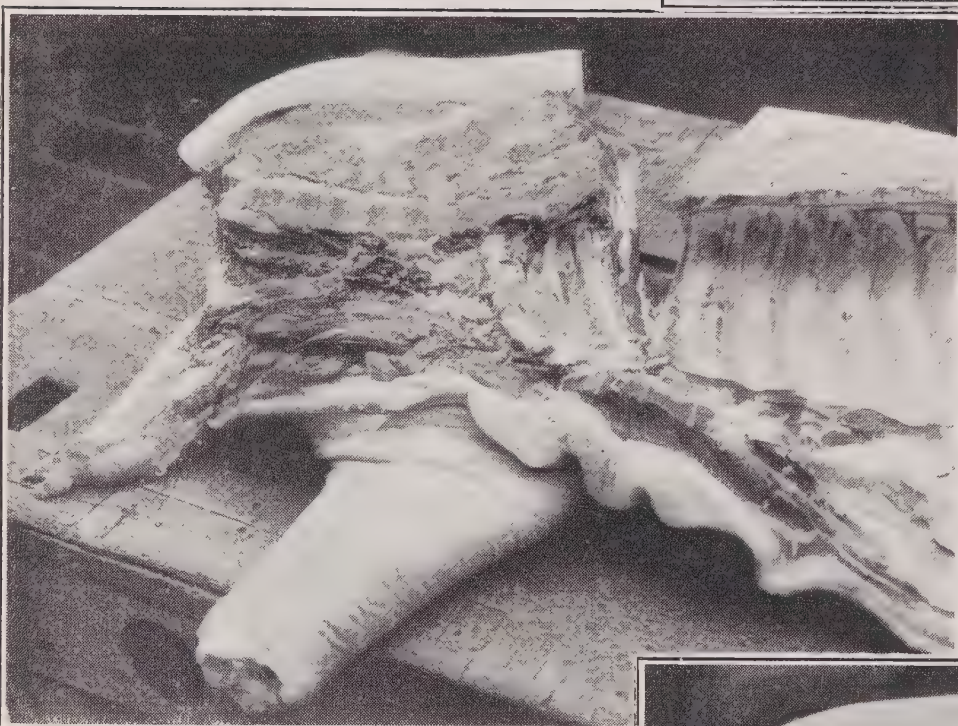


FIG. 10.—Removing the Fore-end. (For the purpose of this photograph, the overlying tissues have been removed from the first three ribs. Normally the first rib is covered and has to be felt by hand. Note particularly the top hind corner of the blade bone pushed back into the cut for demonstration.)

FIG. 11.—Dividing Fore-end into Collar and Fore Hock. (Note that the cut half way down the first three ribs leads directly on to the cup joint between the arm bone and the blade bone.)

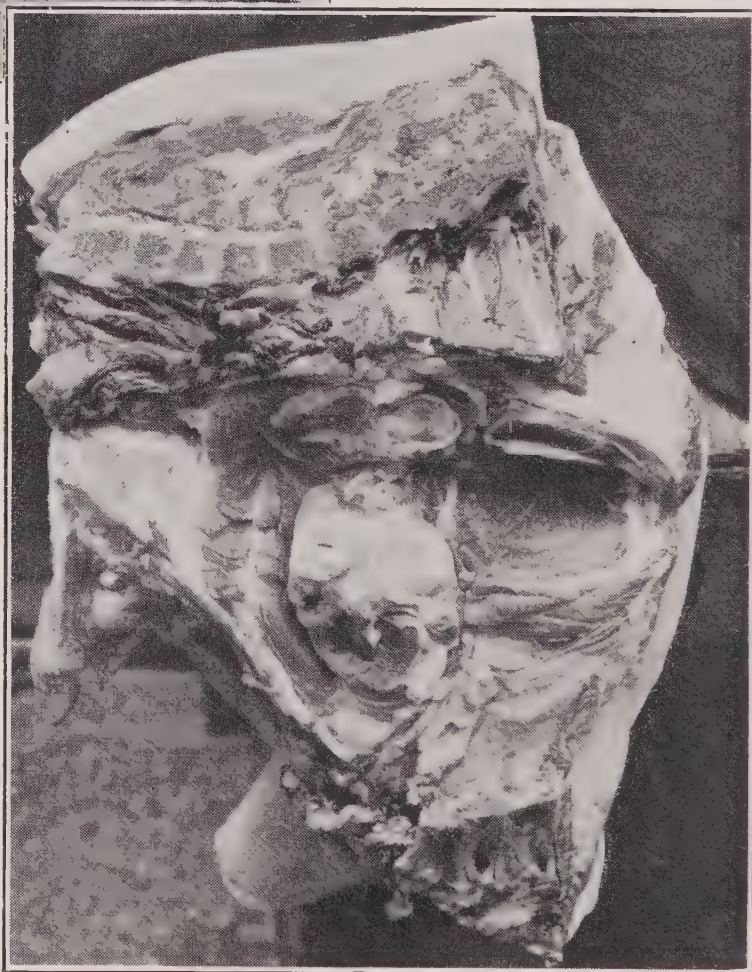




FIG. 12.—Removing the Blade Bone from the Collar to leave the Spare Rib.

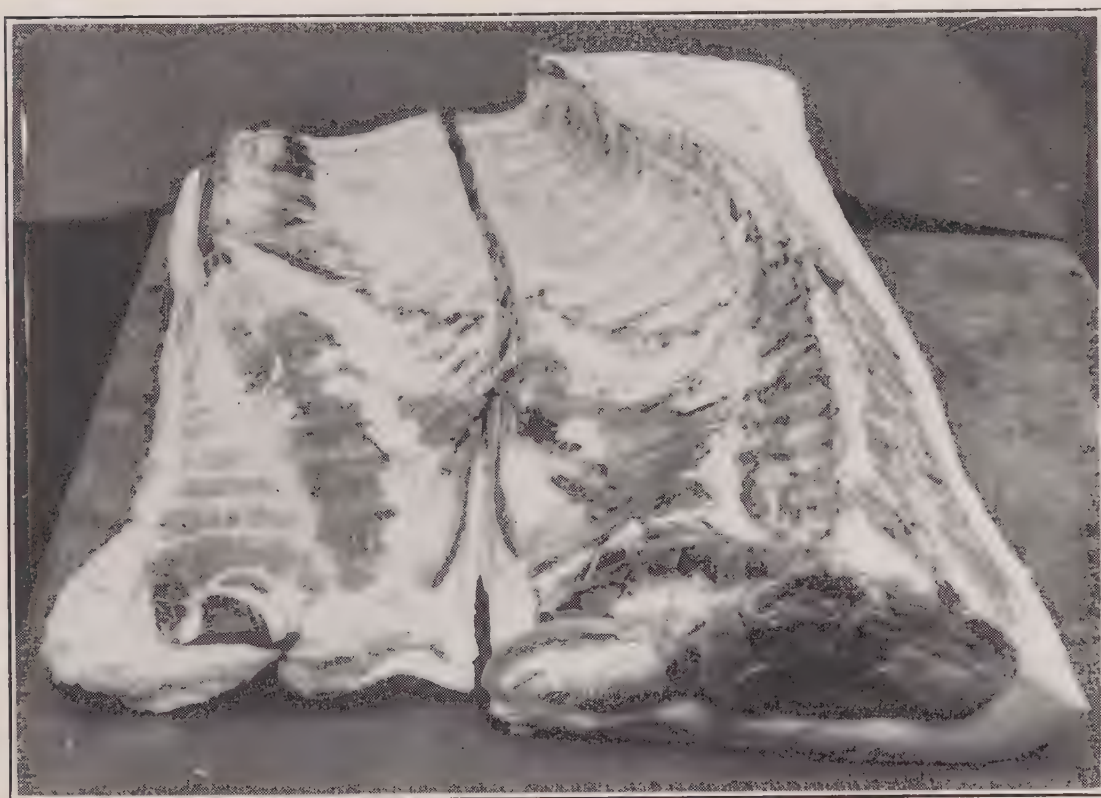


FIG. 13.—Dividing the Middle into Loin and Belly.
(Note the large area of lean from the edge of which the dividing line begins.)

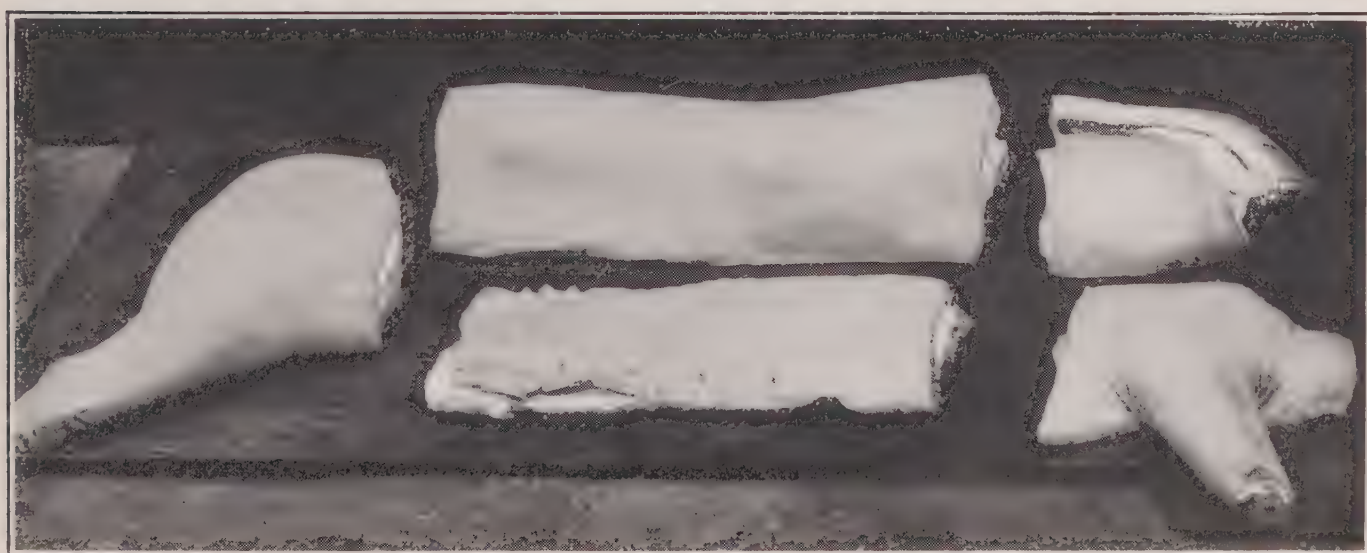


FIG. 14.—Right Side as cut for the Standard Graduated Cure.



FIG. 15.—Hams and Edible By-products from Home-killed Pig.

These by-products, prepared at one of the early courses of instruction, include pork sausage, liver sausage, Scotch white puddings, pork pies, black puddings, lard, black puddings (baked), faggots, meat loaf, brawn and sausage rolls.

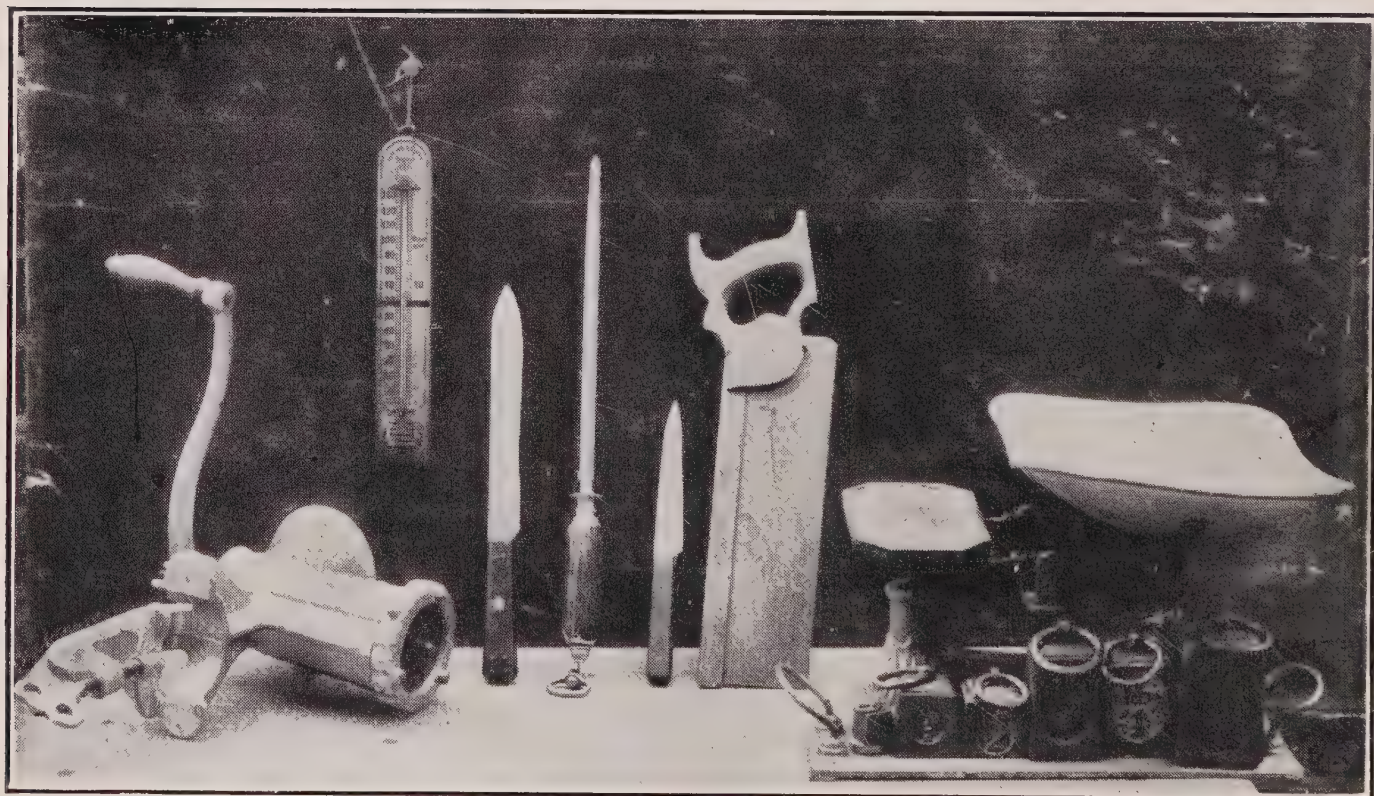


FIG. 16.—Equipment required for Home Curing.

those in solution get drawn to the surface and are thrown away with the surface brine. When meat is immersed in a salt solution these brine-soluble proteins are also drawn out of the meat, possibly to a greater extent.

The higher the temperature, the more rapidly will salt penetrate meat. Penetration becomes very slow at temperatures below 35° F. It takes some time for salt to penetrate thick cuts such as hams. The best temperature for the application of salt is accordingly one which is low enough to keep bacterial growth at a minimum until the salt penetrates to the bone or the deepest part of the cut, yet high enough to permit of that penetration before bacterial growth has become objectionable. Under normal conditions these temperatures are from 38° to 45° F., with an optimum of about 42° F. In practice temperatures may vary from 32° to 50° F. but should not exceed these limits.

The amount of salt in the lean of cured meat varies from about 3 per cent. to 8 per cent. of its weight, but during the process of curing the concentration will decrease from the exterior of the cut surface to the interior. In this connexion it should be pointed out that the rate of absorption of salt through the skin, and the subcutaneous layer of fat normally found under it, is very slow indeed and that most of the salt travels in from the cut surface. Salt has to be applied to the skin side, but the bulk of it does not enter that way.

In the process of dry curing salt is applied in different ways. Usually, to begin with, it is rubbed well into the skin until sufficient moisture is drawn out to start its solution. It is also rubbed into the flesh side, but the meat fluids are there more easily acted on by the salt and less rubbing is required.

It is not possible to get meat to absorb at once as much as 5 per cent. or even 3 per cent. of salt. It is accordingly usual to apply several sprinklings at intervals and to rub each in. If much more salt is applied than can be absorbed a certain amount of brine will be produced and if this is allowed to lie in pockets of the meat or in the flank, then the meat is exposed to something approximating to a brine cure.

On the other hand if, after a preliminary rubbing to moisten the surface, the meat is packed down tightly into a bed of fine dry salt and covered with it the driest form of cure will be achieved. As fluid comes to the surface of the meat it is absorbed by the salt and the surface is never exposed to a brine.

Salt, then, may be applied to meat in different ways. At one extreme the meat may be immersed in brine. Next there is the condition when much salt is sprinkled on the meat and very thoroughly rubbed in. If the resultant surface liquid is not drained off but allowed to lie on the meat, or if it is spooned up out of the curing dish and basted over the meat, then a theoretically dry cure has somewhat the same effect as a wet cure. Light sprinklings of salt, with little rubbing, do not produce much liquid, but the surface is always moist. Finally, where the meat is bedded in salt, the surface is free from moisture, though it must, of course, be in close enough contact with the salt for absorption to be possible.

The wetter the cure the faster the salt will penetrate.

The time required for a suitable amount of salt to be absorbed is believed to depend on the thickness of the meat. The information available suggests that the period should be about seven days for each 1 in. of thickness, with

a maximum period of five weeks. The period will vary, however, according to whether a hard or a mild cure is required.

Saltpetre. Saltpetre is, along with salt, regarded as an essential in the curing of pig meat.

It is available in two forms: Bengal saltpetre or potassium nitrate (KNO_3), and Chili saltpetre or sodium nitrate (NaNO_3).

As already explained, salt alone would be sufficient to preserve the meat. Saltpetre by itself could also be used as a preservative, but because its effect in excess is to make meat very hard, and also because it is not so harmless as a preserving agent it is not used in this way. However, it has another useful effect. On application to fresh meat it is attacked by micro-organisms which change it from a nitrate to a nitrite. Chemically the sodium or potassium nitrate (NaNO_3 or KNO_3) is changed to sodium or potassium nitrite (NaNO_2 or KNO_2).

The pink colour of fresh pork is due to oxy-haemoglobin (the pigment of blood and muscle). Pig meat preserved only with salt loses the natural pink colour and tends to become dirty brown due to met-haemoglobin, a change which makes it appear less appetizing to most people. When nitrite reacts with the haemoglobin of fresh meat it forms nitroso-haemoglobin which is a bright red, somewhat pinker than the natural colour of fresh meat. The prime use of saltpetre in curing is therefore to give an attractive colour.

Only very small quantities of nitrite are required, and Wiltshire bacon only contains about 50 to 100 parts of nitrite in 1,000,000 of lean flesh. If the concentration of nitrite were to exceed about 1,000 parts per 1,000,000 an objectionable colour, such as green, might be developed.

The desirable colour effect can be obtained by applying very small quantities of nitrite direct, and this is done commercially in the U.S.A. and elsewhere.

Sal prunelle, usually obtainable in the form of small balls about the size of a pea or marble, is merely a fused form of Bengal saltpetre and as it contains traces of free nitrite it ensures the desired colour change.

As such a small amount is required to influence colour a common fault is to use too much saltpetre. Occasions when it may be used more liberally are when a cut bone, or the shank end of a cut, has to be sealed against infection. It is also useful in sealing an open surface in cured or partially cured meat, as for example when a bruise or blemish has to be cut out.

In addition to providing nitrite for colour change purposes it is possible that saltpetre may also be valuable because of its special effect in preventing or slowing down the growth of anaerobic bacteria which are responsible for bone taint. Also it probably plays some part in developing the cured flavour of bacon and hams.

Sugar is widely used in home curing, and small quantities have also been used in many factory cures. It is not an essential to curing, and in war time supplies have not been permitted for curing purposes. Nevertheless though its function is not yet fully understood it appears to serve some useful purposes. If it remains unchanged it flavours the cured meat and, in solution, provides a medium in which the growth of undesirable bacteria is reduced. If micro-organisms attack the sugar it will be converted into acid and thus will assist in reducing bacterial growth.

Sugar has the reputation of keeping cured meat soft and may have been introduced to counteract the hardening effect of saltpetre.

There is a possibility that the use of sugar may sometimes lead to a certain amount of spoilage from fermentation.

Home Curing Practice. The theory or first principles on which the practice of home curing is based are closely related to what has been written above. Home curing, however, differs from factory curing in one important respect. The factory cured pig is normally sold and consumed within a few weeks or even days of being cured. The meat has not to be preserved for long and so the concentration of salt in the meat fluids does not need to be very high; nor is it essential that water should be removed from the meat. In fact, lightly cured factory bacon may contain nearly as much water as fresh meat.

On the contrary when a pig is killed for consumption at home there is too much meat to be eaten in a short time, and bacon and hams may have to be preserved for from six to twelve months. To keep meat for this length of time it is necessary that the concentration of salt should be greater. If this is done without reducing the moisture content the total amount of salt in the cured product will be so high as to make it unpalatable. By removing a considerable proportion of water the concentration can be maintained with a smaller total amount of salt.

Although the weight of each cut is consequently reduced it should be realized that no loss of food ensues. On the other hand the lean will become harder though not intrinsically tougher and this difficulty can to a large extent be overcome by attention to soaking and cooking.

By comparison with factory cures, therefore, home curing is a hard or heavy cure, and it cannot accordingly provide the same light quality of cured meat as a factory cure. To many tastes, however, the quality is better.

A STANDARD GRADUATED CURE

It has already been explained that there are variations in the way in which a carcass can be cut up, and that the way in which salt is applied also varies. The combination of the method of cutting with the salting method really constitutes the curing method, and there is a considerable variation of practice from one part of the country to another. It is important for teachers to have experience of the more typical methods, first because they may have to advise concerning faulty results obtained from the use of any of them, and secondly because they might feel that any one of them could most effectively be taught or demonstrated in a certain district.

Reasons for Standard Cure. Any complete course of training should therefore include a consideration of the more important methods. Several factors, however, militate against training on these lines at the present time (spring, 1945). The time available for training teachers is very limited. There are obvious difficulties in obtaining sufficient pig carcasses for the practice work involved. Instructors and instructresses will have to concentrate all their available time on imparting to home pig curers the minimum of essential information to prevent spoilage of home-cured meat.

For these reasons it has been felt that, while teachers should be given the widest possible training in the first principles of curing which a limited training period may permit, it is advisable that their practical training should be restricted to a single standard method; this method, too, should be the only one to be taught by them during the difficulties of the war period.

In deciding what this one method should be, the Home Curing Committee had to consider whether it should approximate to one of the numerous methods employed in practice, or whether a standard method should be evolved, based primarily on the first principles involved, and best suited to the needs and varying capacities of the majority of people requiring guidance.

Reasons for Graduated Cure. The latter course has been adopted, and for reference purposes the method has been called a standard graduated cure. The expression "graduated" needs some explanation. When a pig is killed at home the whole of it (under rationing regulations at least) has to be utilized by the owner's household. From one quarter to one third of the carcass and offals is consumed fresh or in the form of lightly preserved small goods. These must be finished within about a fortnight or less of slaughter. Of the cured meats some will be consumed within a few weeks, while the remainder will be eaten at varying periods up to six or even twelve months.

Obviously the longer keeping pieces must be hard cured, but as hard curing has drawbacks as well as advantages there is no reason why it should be applied to meat that will not be kept for long. Again, even if it were decided to submit all parts of the carcass to the same strength of cure it has to be realized that different parts are of different thickness. But as the length of time in cure to produce a given strength of cure is believed to depend on the thickness of the cut rather than on its total weight, it is clearly desirable that each cut handled should, so far as is practicable, be of approximately equal thickness.

From this it follows that inexperienced people will most easily be able to control the degree of cure if the carcass is divided into a number of cuts of approximately even thickness. It is easier, too, in practice to handle cuts of reasonable size rather than sides or very large cuts, and it is easier to find vessels in which they can be accommodated.

DETAILS OF GRADUATED CURE

Method of Salting								
CUT (see Fig. 14)								
First Side								
(1) Ham	...	...	...	...	...	...	...	6-7
(2) Belly	...	...	...	...	...	...	...	3-4
(3) Loin	...	...	...	...	...	...	...	5-6
(4) Spare-rib	...	...	...	...	...	...	...	Fresh
(5) Blade-bone	...	...	...	...	...	...	...	Fresh
(6) Fore-hock	...	...	...	...	...	...	...	Mild Pickle 6-7 days
Second Side								
(1) Ham	...	...	...	...	...	...	...	6-7
(2) Loin	...	...	...	...	...	...	...	8-9
(3) Belly	...	...	...	...	...	...	...	9-10
(4) Fore-hock	...	...	...	...	...	...	...	7-8
(5) Collar	...	...	...	...	...	...	...	7-8

Distribution over 12 months

<i>Weeks from Killing</i>	<i>Strength of Cure</i>	<i>Use as</i>	<i>From</i>
1	Uncured ...	Fresh sausage ... Small goods grilled or fried Chops ... Roast pork ...	Trimnings and offal Filets Spare-rib ... 1st side Blade-bone... 1st side
2-3	Uncur ... Pickle ...	Cooked products ... Salt pork (hot and cold)	Trimnings and offal Fore-hock from 1st side
3-8	Lightly Cured	Bacon ...	Belly ... from 1st side
8-16	Medium Cured	Bacon ...	Loin ... from 1st side
16-24	Well Cured ... " " ...	Boiled ham ... Bacon ...	Fore-hock from 2nd side Collar ... from 2nd side
24-32	Well Cured ... " " ...	Boiled ham ... Bacon grilled ...	Knuckle end of Ham from 1st side Fillet end of Ham ... from 1st side
32-40	Well Cured ...	Bacon ...	Loin ... from 2nd side
40-46	Well Cured ...	Bacon ...	Belly ... from 2nd side
46-52	Well Cured ...	Boiled ham ...	Ham ... from 2nd side

Details of Cure. The standard graduated cure here described and outlined in the table on p. 34 aims at meeting these requirements, but it should be regarded as merely illustrating the general principle of adjusting the cutting and curing to meet the individual requirements of each household. There is no reason why the method should be followed in detail. For example, some people keep only half a pig for home use and sell the other half. In that case the differential cutting and curing of the meat should be adjusted as required, and an individual schedule prepared.

Cutting. As mentioned in the section on cutting, it is better for novices not to attempt the exact jointing that is a simple operation to an experienced butcher. There are advantages in the shape of a traditional long-cut ham, but there is less waste in one which is cut straight across than where an unsuccessful effort is made at shaped cutting.

Assuming that the butcher has left the carcass whole, cutting should begin by hanging up the pig by the gam-cords (i.e., hock tendons) of the right leg. Insert the point of the knife in the anal cavity and draw the knife forwards and downwards, dividing the two legs by splitting through the cartilage of the aitchbones. (Note that the legs may have been split following slaughter.) Standing behind the pig, feel for the line of the vertebrae, down the back of the pig, and cut through the skin and fat, immediately over the bone, extending the cut down to the nape of the neck. Then make a cut across the neck just behind the ears and cut downwards round the left side of the head (your right hand) following the curve of the jaw (Fig. 6). Standing in front of the carcass, saw down the *centre* of the back-bone, picking up the cut on the other side (Fig. 7). (When you are about half-way down you will have to

support the other leg on a hook, unless someone can take the weight.) When you reach the transverse cut already made, loosen the cup joint of the head with a knife and the side will swing clear, leaving the head on the pig's right side (Fig. 8).

Lay the right side on a table, skin side down, and remove the head by cutting round the cup-bone and following the line of the jaw, as before. Cut off the trotters, the hind foot at the hock joint and the fore at the wrist.

Pull out all the flare fat and the kidney, and trim away the skirt (diaphragm), close to the carcass. Carefully cut away the fillet.

To remove the ham take a line about 2 in. below the knob of the aitch bone and saw through the bones (the sacral vertebrae and the hip bone or ilium) keeping the cut square (Fig. 9).

Then pull the leg over the end of the table and, holding it in the left arm, cut off the ham, using a curved sweeping cut, with the point of the knife sloping away from the shank. Trim up the ham, removing the flank part and if necessary shaping up the tail side.

To remove the fore-end, saw through the chine bone over the space between the third and fourth ribs, and through the breast-bone below the space between these ribs. Then cut through the flesh with a knife, passing between the third and fourth ribs (Fig. 10). The knife will pass through some of the cartilaginous extension at the top end of the blade bone. In some positions of the foreleg, it may even run on to the blade bone itself at its top hind (posterior dorsal) corner. By pressing the foreleg backwards, this point of the blade bone can be moved forward and clear of the space between the ribs. The fore-end portion is next divided by sawing across the ribs, towards the lower or hock-end of their middle line, and cutting down on to, and between, the cup of the blade bone and the humerus (Fig. 11). (Should this joint be missed it is probably better to saw through the bone than make a number of cuts in the flesh.) The portions so produced are usually known as the collar and the fore-hock.

The collar is further divided into two pieces—the blade bone and the spare-rib. When from the right side, as in this case, it should be laid in front of the cutter, skin side upwards, and with the neck end away from him. His left hand is placed over the blade bone and pressed downwards and towards the right bottom corner. With the right hand the knife cuts through the back fat and round the top of the bone. The bone is then grasped at the cup joint and pulled upwards while the knife is inserted under it to remove it from the spare-rib (Fig. 12). A certain amount of meat should be left on the latter cut which can be used to supply chops. The blade bone can be roasted.

The portion of the side remaining is referred to as a "middle" and the next thing to do is to divide it into a loin and belly (Fig. 13). The line between these is somewhat arbitrary, but as it is simpler to cut in straight lines the following procedure is advised.

Keeping the fore-end away from the cutter, make a mark on the far rib about 2 in. from the back-bone. Next locate the large area of lean at the ham end of the middle. At the end of this muscle make another mark. Connect these two by a straight line. Saw through the ribs only and complete the division with one clean cut of the knife. (When sawing it is a good plan to place the left hand under the middle to push up the ribs and avoid sawing the meat.)

Then saw away the chine bone from the loin by cutting through the ends of the ribs, close to the chine bone, but on no account saw into the meat.

The left side should be cut in the same way except that the collar is left whole.

The only other part of the carcass that needs cutting is the head. This should be dealt with by sawing down through the frontal or face side of the skull and through the top of the lower jaw. The bones at the back of the head should then be chopped through and the halves pulled apart without damaging the brain or tongue. The brain should be removed, the tongue cut free and the two portions of the head separated. Remove the eyes, chop or saw across the snout and wash all parts well before putting them in pickle. Curing should be commenced immediately after cutting, for if meat is allowed to remain exposed to the air for any length of time, there is greater risk of contamination.

Cleansing. Cleansing or purging the fresh meat for a short period before curing is a common practice in order to get rid of small quantities of blood which may be the result of incomplete bleeding or which may be found in the large veins of the ham and shoulder. It is not a process which is universally adopted.

The method recommended for this provisional standard cure is to dip the cuts for a short time in a strong brine. This has several advantages. It is rapid and allows the full cure to be proceeded with at once. It provides the wet salt surface which starts the penetration of salt into the meat without the laborious process of rubbing. In addition this brine can be watered down after cleansing and used for the light pickling of small cuts or offals.

The brine is prepared by dissolving 13 lb. of salt and 4 oz. of saltpetre in 5 gal. of water. The salt and saltpetre should be stirred into hot or boiling water. After thorough mixing the solution is cleaned by straining through a cloth, and must be allowed to cool off to 50° F., or preferably lower, before using.

The loins and bellies should be immersed for ten minutes till clean. The collar and fore-hock from the second side should be treated in the same way but left a little longer, say half an hour, as there are more corners and irregularities to clean. The two hams will require longer still, about an hour, and while in the brine the large veins should be squeezed from the hock-end to the wide or fillet end.

After cleansing, the cuts should be laid, skin side upwards, to drain but not to become dry, and each should be labelled with its name and the side it comes from, its weight, thickness in inches and time in cure worked out according to the table on p. 34.

Pickling. After the brine has been used for cleaning it should have 1½ gallons of water added to it and should be thoroughly stirred. This will produce a suitable pickling brine.

Wash the head and feet thoroughly and place them in the pickle. Add the tongue and tail also the fore-hock from the first side.

Salting. For this part of the process there will be required a mixture of salt and saltpetre for penetrating into the meat, and salt for bedding the meat, to keep it dry. During war time no sugar should be used. The quantity of curing mixture required will depend on the quantity of meat to be cured. Allowing for the wastage, the approximate amount for curing is calculated as follows:—

Weigh the quantity of meat to be cured and allow one-tenth of this as salt. The amount of saltpetre required is one-fortieth of the weight of salt. Thus

for 100 lb. of meat to be cured, there would be required 10 lb. of salt and 4 oz. of saltpetre. Owing to the small proportion of saltpetre the mixing must be very thorough. To ensure this, use dry, sieved salt. Divide it into 3 equal parts and add to each the appropriate amount of saltpetre which has been crushed and sifted. Mix the salt and saltpetre very thoroughly and if possible sieve the mixture. In the case of the above example each of the three piles of salt would contain $3\frac{1}{3}$ lb. and to each would be added $1\frac{1}{3}$ oz. of saltpetre. Do not mix together the three piles of curing mixture, as one will be required for rubbing in, one for sprinkling and the last for sprinkling at the time of rebedding.

After the cleansing brine has drained from the cuts, they should be rubbed thoroughly on the skin side with $\frac{1}{3}$ rd of the curing mixture. Some of this should be forced down the shank of the hams and of the fore-hock.

The mixture should then be rubbed into the flesh side rather lightly, using rather more of the cure for the thick cuts such as ham and collar.

The next procedure is to prepare a bed of salt about 2 in. thick, and to press down each cut into it, skin side downwards. The cuts are then further sprinkled lightly with the second $\frac{1}{3}$ rd of the curing mixture according to their thickness. All the cuts are then entirely covered over with from 1 to 2 in. of salt, taking special care that the salt is tightly packed at the sides. The tendency is for the meat to shrink and draw away from the salt, and where this occurs the surface will dry and there will be irregular salting. If possible, the salting should be done in a tray or dish with low sides to ensure satisfactory lateral packing of the salt. An alternative is to pack down tightly, in boxes or crocks.

After five days the pack should be broken and any spent discoloured salt removed. The cuts can then be repacked, sprinkling as before with the remainder of the curing mixture. This time, however, the cuts should be placed in such a way that those which are to remain in salt for the shortest period can be removed first. The hock or shank end of the hams should be supported so that the flesh side of the ham is horizontal.

The cuts are to be kept in salt for varying periods according to their thickness and the degree of cure required. The periods suggested are set out in the table on p. 34. Care should be taken that salt is carefully repacked after each removal of meat.

WASHING, MATURATION, SMOKING AND STORING

Washing and Maturation. When meat is removed from the salt bed, the surface can be thoroughly washed in cold water, to remove the outer layer of salt, because if this is left the meat will become too salt and a damp surface may result, encouraging the growth of slime-producing organisms. Alternatively, after the bacon or hams has been removed from the salt bed it should be left in the room where it has been salted for a further period of two to four weeks, depending on thickness. This enables salt and saltpetre to go on penetrating until the deep-seated parts of the flesh contain enough curing mixture to prevent the growth of undesirable bacteria. During this period the maturation of the bacon and hams begins, continuing during the subsequent operations of drying, smoking and storage. Although maturation is a process about which we still have incomplete knowledge, it is clear that it involves the even distribution of salt, saltpetre and nitrite. The cured colour, due to nitrosohaemoglobin develops and the typical flavour of cured meat becomes evident. The cause of the flavour is not fully understood, but the presence of nitrite appears to be essential. During the maturation, too, the microscopic structure of the muscle

fibres changes, fluid from between the fibres being drawn into the fibres. Even after this preliminary maturation at a low temperature the surface of the lean still contains an excessive amount of salt. This is removed by washing with cold water or even by soaking in a little water overnight.

Drying. This should be carried out by hanging in a warm situation where the optimum temperature should be about 60° F., but should not exceed 70° F. Usually as drying proceeds a white surface layer of crystalline salt appears. This deposition should not be excessive if the washing has been thorough. The more difficult it is to obtain dry storage conditions, the more important it becomes to remove the surface salt, as its hygroscopic qualities tend to attract moisture during the drying and subsequent storage.

Smoking. This should be considered as an alternative method of drying. In addition, however, smoking introduces preservatives and flavouring substances (formaldehyde, tars, phenols, etc.) into the meat. The onset of rancidity too is retarded by some of the preservatives in smoke. It is important that smoking should be carried out at temperatures below 90° F., otherwise the fat will melt; and that sufficient moisture is removed from the bacon or ham. Home cured bacon and ham was originally dried and smoked by hanging it far up the wide chimney of old-fashioned fire places with wood fires. Many bacon factories are prepared to undertake smoking but it must be emphasized that home cured material needs twice to three times as long in smoke as is given to mild cured Wiltshire bacon. Smoked hams and bacon should not develop mould during storage; the presence of moulds indicates incomplete drying during smoking or over-moist storage conditions.

Storage. This should be carried out as far as possible in the dark. A suitable temperature would be about 60° F., but it does not harm to store at temperatures down to 32° F. provided variations are as far as possible avoided. If the storage temperature has been low and then rises, there will be a time lag before the meat rises to the same temperature as the air. Should the temperature of the meat surface be at any time below the dewpoint, that is the temperature at which water vapour condenses from the air, then a film of moisture will be deposited and this will negative the effect of the dry surface obtained by drying.

If bacon and hams can be kept under dry conditions then they may be hung up without any covering. Added protection, however, is supplied by wrapping the meat in paper or cloth and then surrounding it with some substance which will take up moisture from the air. Kiln-dried salt can be used, but it must not come in contact with the meat, and preliminary wrapping is essential. Slaked lime, charcoal, wood ashes, malt culms, dried oat hulls, or oat meal provided it is free from mites, may be used, if not subject to rationing regulations. Storage in any of these materials does not affect the flavour, but suffices to maintain bacon and hams at an even temperature, dry and excluded from the light.

With ashes the method is to sift some clean dry wood ashes into a box and to put a layer of them between each layer of wrapped meat finishing with a layer of 6 or 8 in. of ashes. The box should be kept in a dry place and if the ashes get damp they should be removed, dried and replaced. Oat hulls and meal are used in the same way, but a watch must be kept for mice and mites.

Cured meat may be conveniently stored by hanging up in clean linen or calico bags and lime washing the bags two or three times.

BACTERIA, MOULDS AND PESTS

Pests. Three kinds of insect are liable to cause damage to cured meats.

MITES (*Tyroglyphus siro*) live on cheese and dried fruits and look like a white dust. They may attack home-cured meat but are not likely to be present unless sugar has been used in curing or there is cheese in the vicinity.

CHEESE FLY (*Piophilidae casei*). The maggot of this small black fly, known as the skipper jack, is so called because it has the capacity to bend both ends of itself together and then jump. It devours hams if it can get to them. Careful wrapping and a dry, hard surface help to defeat it.

LARDER BEETLE (*Dermestes lardarius*). The larva of this beetle is large and hairy and can bore through hard substances. When the grub is ready to pupate it bores into woodwork and remains there until April or May, when the adult beetle emerges to climb up the wall and glide down on to the hams, where it lays its eggs. The larvae which come from these eggs attack the ham. This pest, though fortunately not common, is difficult to eradicate. It has been found that sticky grease bands, as used on apple trees, if put all around the room including the door, will trap the beetles when on their way up the walls before passing to the hams.

FLIES may prove troublesome by depositing eggs if the cure is mild and the surface moist, but if the cured meat is adequately stored this should not occur. A dusting of black pepper in the crevices and around the bones where flies are most likely to attack will act as a repellent.

RATS AND MICE. Rats and mice may attack cured meats especially when meal is used for storage.

Bacteria. The prime object of applying salt in curing is to inhibit the development of putrefactive bacteria in the meat. Other bacteria which may give trouble are those which produce slime on the surface during or after curing. Their growth is only slowed down by salt, and dryness in storage is the best way to combat them. Home cured bacon and hams adequately dried or smoked should remain free from slime.

Moulds. Moulds do not grow on meat while it is in pickle or undergoing dry cure. They are a common occurrence at any time after washing. The common blue-green mould of the penicillium type is advantageous on dried hams. Under moist storage conditions black, red or white moulds are more likely to occur and their presence may be associated with spoilage. Smoked meats should not be allowed to grow moulds.

When a piece of cured meat has been cut and is then stored for a further period there is liable to develop a white mould which liquefies the lean meat at the cut surface and produces a strong smell of ammonia. This is similar to the organism causing deliquescence in a Camembert cheese. If the layer of meat attacked, is cut away the rest of the cut will be unaffected and may be safely consumed.

One of the reasons for curing meat in a number of cuts is avoidance of the need of strong cured meat for any length of time after it has been cut into.

PREPARATION AND COOKING OF HOME-CURED MEATS

With the object of obtaining long storage qualities home-cured meats are of necessity hard cured and consequently they may prove too salt unless soaked prior to cooking. It is impossible to lay down any hard and fast rules, as the thickness of the portion, the quantity of fat, the surface dryness and the quantity of cure employed will all influence the period of soaking

which is necessary. In some cases a few hours would be sufficient, whereas, with a really thick cut, hard cured, 48 hours, using several changes of water, might not prove too long.

Boiling Hams. The following method is suggested as being suitable in the case of hams, shoulders, hocks, etc., intended for boiling. With tepid water wash off any "bloom" that may be present and soak as required. Weigh the portion, as this is a convenient method of calculating the cooking time. Place

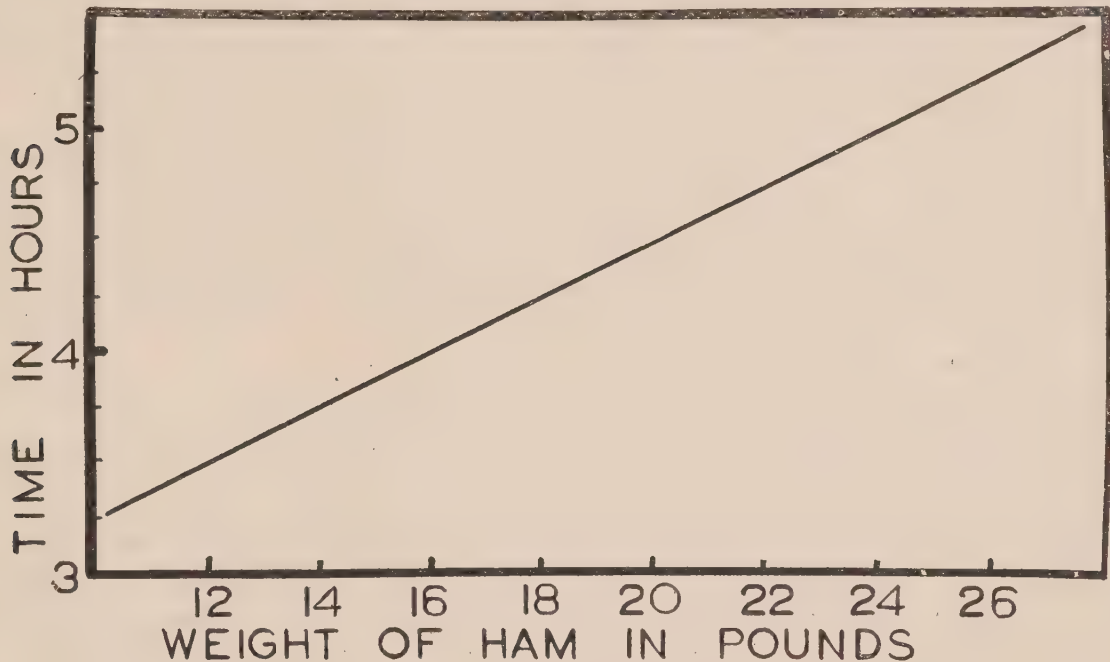


FIG. 17.—TIME GRAPH FOR THE COOKING OF HAMS.

(To ascertain time required for hams of various weights to simmer *after* water has reached boiling point, draw a line vertically from the no. of lb. to the diagonal line, then another horizontally from the diagonal to the hour scale.)

in cold water and bring to the boil. When the water is boiling, reduce the heat to obtain a steady simmer and cook according to the chart above. At the end of this period either remove the container from the heat or, in the case of a copper, turn out the gas or damp down the fire and leave the meat in the water for an additional half-hour. With large hams it is a good plan to suspend the ham with the shank just projecting above the surface slightly. This will prevent overcooking of the thinner portion and the danger of flesh drawing up from the bone. If the ham is to be served hot the skin must be removed immediately after cooking; otherwise it is desirable to place the ham in a cool situation for at least 12 hours to get thoroughly cool and set. This should be followed by skinning and dressing with toasted bread crumbs.

To Glaze Boiled Hams. A glaze for ham can be prepared from a good meat or bone stock which is steadily boiled to drive off excessive water so that on cooling a firm jelly is obtained. If necessary browning can be added to obtain a good colour. The jelly stock should be placed in a container to set, and when required the vessel can be placed in a saucepan of hot water until the jelly is melted, when it can be painted on to the ham with a brush. In most cases two coats will be necessary to obtain a good finish, allowing the first coat to set before adding the second. As an alternative, glaze can be prepared by using gelatine, and adding hot water in which has been dissolved a meat cube. With a good grade of gelatine 5 per cent. will produce a suitably firm glaze.

Baked Ham. It is the usual practice to boil hams intended for baking for, say, half the total cooking period, allowing an overall cooking time of 20 minutes to the pound. After the initial boiling the ham should be covered with a fairly heavy paste about $\frac{1}{2}$ in. thick and baked in a moderate oven (about 350° F.). When cooked, the browned jacket can be left on or it may be trimmed off with the skin. Smithfield (Virginia) hams are sometimes baked without preliminary boiling. The skin is scored, diamond pattern, penetrating the fat to a depth of about $\frac{1}{2}$ in., followed by baking in a moderate oven.

It is a good plan to retain paste in position by tightly wrapping with muslin. The chief advantage of baking in paste is that the flavour and meat juices are retained.

Steaming. The normal size of domestic steamer is seldom large enough to accommodate a good sized ham, but it is possible to improvise by using a meat stand in a large boiler, keeping the ham just above the level of the water. As the water boils away it will be necessary to replace it with boiling water, so that a large kettle or similar vessel should be handy for replenishment.

Fore-hocks. The presence of the shank-bone and humerus makes this joint somewhat difficult to carve, and many prefer to remove these bones prior to boiling. The shank-bone should be removed first, and the arm-bone "tunnelled" out with a thin sharp knife. The muscle of the shank can then be inserted into the tunnel and the whole joint tightly rolled up, prior to boiling. Should a meat press be available, the rolling can be dispensed with, the meat being pressed immediately after it is removed from the water. The cooking period will depend to a great extent on the thickness, but as a general guide 25 minutes to the pound should be allowed. (Ham skins can be minced and used in faggots, meat loaves and similar products.)

Carving a Cooked Ham. The best results will be obtained with a long narrow knife, thin and really sharp. The object should be to obtain large thin slices with a fair distribution of the fat and to finish with the ham-bone clean. It must be remembered that there is a right and left hand ham, and this will influence the method of cutting. In both cases the ham should be placed with the aitch-bone side downwards and the flank towards the carver. Start cutting downwards towards the shank-end, which is lean, and follow this by cutting from the flank, which for the first few cuts will be fat. Subsequently the slices should be cut from each side alternately.

LOCAL METHODS OF CURING

Many variations in method are peculiar to individuals rather than localities. There are, however, certain general trends in local procedure, and the methods described below may prove of interest for purposes of comparison. It is possible that local conditions, particularly temperature and humidity, have played an important part in the adoption of a certain method and what might be applicable to one district might not of necessity produce the best results in another. A few representative methods have been selected to illustrate the variations in cutting, application of salt, the time in cure, and the storage of cured meat, but many of the recipes have not been tested under varying conditions and therefore no responsibility can be taken for them.

RECIPE I. In certain districts the sides are cured whole by a dry cure method. A large carcass of 16 to 20 score is preferred and it is dehaired by

singeing. In cutting, the head, the chine with some of the back meat, and the ribs with a coating of lean meat are removed.

Cleansing is done by sprinkling the flesh side with salt and rubbing salt into the skin. After leaving the sides, flesh side down, to drain for 24 hours, they are wiped with a clean cloth. The curing then commences by sprinkling saltpetre on the flesh side of the shoulders and hams. About half the salt is sprinkled over the sides which are placed one on top of the other on a salting stone. After seven days half the remaining salt is sprinkled on and the side which was on top is placed at the bottom. Seven days later the remaining salt is added and the positions of the sides again reversed. The sides remain in cure for about four weeks and about 28 lb. of salt and 8 oz. of saltpetre are used.

When the sides are removed from the cure they are wiped off and hung up to dry for seven days. The sides may be stored whole but for convenience are often cut into hams, middles and shoulders before being hung up in clean cotton bags.

RECIPE II. A carcass of about 8 score is preferred. The carcass is split and from each side is cut a rounded ham and a round shoulder, known as a fore-ham. The middle is deboned except the chump end of the loin, which is often used fresh or lightly salted. The middle may be subdivided into back and belly to facilitate packing into crocks. For a 15 lb. ham or fore-ham a sweet pickle is made from $\frac{1}{2}$ lb. block salt, 1 lb. dark treacle, $\frac{1}{2}$ lb. brown sugar, 1 pint dark vinegar and 2 pints old ale, also one tablespoon saltpetre or less if desired. Salt is first rubbed into the knuckles and sprinkled over the joints which are then placed in a crock and the pickle poured over. For the first week the joints are turned twice daily, and subsequently once daily. The time in cure is from four to five weeks and the hams are ready for use in six months. The hams are not soaked before cooking.

The pickle for 15 lb. of bacon consists of $\frac{1}{2}$ lb. salt, $\frac{1}{2}$ lb. brown sugar, a little treacle and a small quantity of vinegar but no saltpetre. The meat is packed in crocks and the pickle poured over. The joints are turned daily during the three weeks they remain in cure. The bacon is ready for use immediately it comes from the cure or as required. The bacon is or may be soaked for one week with several changes of water before cooking.

When the meat is taken from the pickle it is hung up to drain for 24 hours and then encased in two bags and suspended from a hook.

RECIPE III. This is specially suitable for a heavy carcass. There are three common ways of cutting, first a chine 6 to 8 in. wide may be removed and the "long side" salted, or the carcass may be simply split, or thirdly, it may be cut into hams, fore-hams, and middles. The first method gives a fat bacon, and the second a lean bacon but not much "pig cheer."

The ingredients for curing are 28 lb. of salt, $\frac{1}{2}$ lb. of saltpetre and 1 lb. of demerara sugar. The saltpetre is applied first and is spread most thickly on the "blood patches." The meat is sprinkled with salt and packed on a layer of salt in the salting trough. The hams are always placed on top and every day for a fortnight salt is sprinkled over the meat.

When the meat is cured it is wiped off and sprinkled with flour. After being dried for three months it is packed in a bin containing slaked lime.

RECIPE IV. Scalding is the usual method of dehairing. The importance of fasting, good slaughtering and efficient cooling is stressed. The common

practice is to cut off a long-cut ham, sloping the knife to leave the lean encircled in fat. The curing mixture for a medium-sized pig is 25 lb. of salt, $\frac{1}{2}$ lb. of saltpetre and a little demerara sugar if possible. Both the salt and the saltpetre must be thoroughly dried, crushed and sieved. The cleansing is rather more elaborate and consists of, first, removing the larger blood vessels from the hams and shoulders and packing the spaces with curing mixture; second, inserting a steel down the shanks and filling the space with the salt and saltpetre mixture; third, sprinkling the flesh side and rubbing the skin side with the curing mixture; and finally leaving the meat to drain for 24 hours before wiping and pressing out any blood accumulations with a clean cloth.

For the actual curing the meat is placed skin side down on a bed of salt 1 in. thick and is sprinkled with the salt and saltpetre mixture to which a little demerara sugar has, if possible, been added. The whole is covered to the depth of one inch with salt and is left for a fortnight, which is sufficient for the spencer of a 10-score pig. If the carcass is larger, the salt pack is broken and half the first quantity of common salt sprinkled on and the carcass bedded down again for a further week. Hams from a carcass of less than 10 score require three weeks to cure, from a pig over 10 score four weeks, and where the carcass is over 17 score 10 lb. an extra week in salt will be required for both bacon and hams.

When the cure is complete the salt is brushed off and the meat hung up in a warm atmosphere for three weeks to dry, before being stored in linen bags in a dark airy place.

RECIPE V. The carcass is cut first into quarters. The hams and shoulders are then removed and trimmed. The bones are removed from the loin and back, from which the belly portions are then cut out.

The hams and shoulders are rubbed with salt and allowed to drain for two days. They are then rubbed with a mixture of 4 lb. salt, 4 oz. saltpetre and 4 oz. black pepper daily for four days when the mixture should be all used. Two lb. of black treacle is then poured over and the joints turned and basted in the pickle daily for four weeks. After washing they are hung to dry and then smoked over a fire of oak and oak leaves. The bacon is cured by placing it in a trough on a bed of salt and rubbing in a curing mixture made from 6 lb. salt, 3 oz. saltpetre, 4 oz. sugar and 2 oz. black pepper. (These quantities assume a 10-score pig). The joints are basted and turned daily for three weeks, then washed and hung to dry.

RECIPE VI. A carcass of between 10 $\frac{1}{2}$ and 13 score is preferred. When the carcass is cool it is split down the back, and a small ham with as little surrounding fat as possible is cut out under the tail well back from the flank. The ribs and back-bone are taken out with a generous coating of meat and are used fresh. The spencer is then trimmed up to make the corners square. For cleansing the meat is simply allowed to drain overnight. Half an ounce of saltpetre for each score of the dressed carcass is weighed out and divided into four. Each quarter is sufficient for one ham or one spencer. The saltpetre is rubbed into the skin of the spencer until it sweats and then salt is rubbed in. The spencer is then placed skin side down on a layer of salt in the thrall, and saltpetre is sprinkled over the blade bone and salt drifted over the whole. The knuckles, aitch bone and skin of the ham are rubbed with saltpetre before both skin and flesh are rubbed with salt.

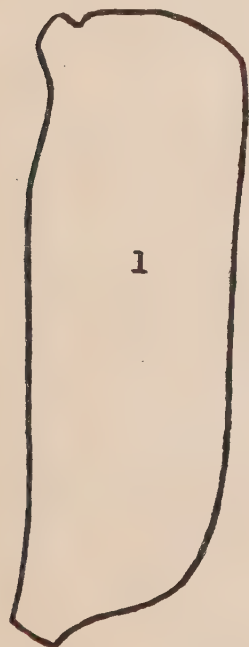
The order of packing the carcass in the thrall is, first the two spencers skin side down with salt sprinkled between, then the hams are placed on top with the chawls (cheeks) in between, and the eye-pieces and feet are packed in and salt drifted over.

Ten days later the salt is removed from the pieces and the thrall cleaned out. The salting process is repeated except that no saltpetre is used and the spencer which was on top is put to the bottom. After a further 10 days the salt is brushed off the meat, which is put to drain before being hung in a cool passage for six months when it should be ready for use. If sugar is used, half a pound is required and it is spread evenly over the flesh side of both hams and spencers at the first salting.

RECIPE VII. A pig of 12 stones is liked for killing in October or November to take advantage of cool weather for curing and to have bacon fat for oat cakes throughout the winter.

The carcass, after scalding, is thoroughly cooled and then cut into quarters and the bones carefully removed. About 2 oz. of saltpetre is rubbed into the flesh side of each quarter and salt is packed into the pockets made by the removal of the bones. The quarters are then placed in a strong cold brine. After seven days the positions of the quarters in the crock are reversed from top to bottom. The meat is left in pickle for ten days to three weeks, depending on taste and requirements, and then hung up until nearly dry. The quarters are then rolled skin side out, starting with the thinnest part, the belly, and finishing with the thickest. The rolls are hung up in a reasonably dry but not too warm a place and covered with muslin as a protection from light, flies and dust. Ayrshire farm house bacon does not have the skin removed.

In summing up the various methods it can be said that there is a good deal of personal opinion and personal art in all recipes. As to whether a wet or dry cure is used traditionally depends to some degree on climatic conditions but to a greater extent on local taste, some preferring the sweetness and juiciness of the pickled meats, others the fuller flavour and drier texture of the dry cured meats. There are many recipes for both methods of curing but the newcomer to the art should beware of over-simplification. Many of the recipes may appear to contradict one another, though when essentials are disentangled they do link up with first principles and may be sound. A larger number of recipes contain special flavouring ingredients and the novice may lose sight of the fact that actually salt is the only essential curing ingredient.



RECIPE I

For curing
1. side

*For use fresh or very
lightly cured*

head
trotters
chine and some back meat
fillets
griskin
skirt



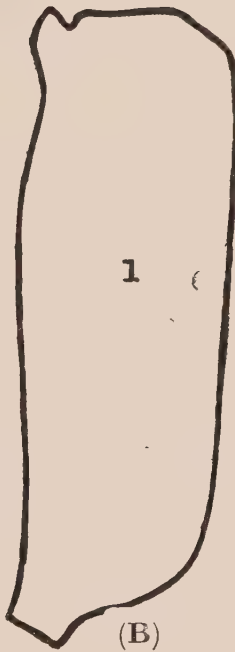
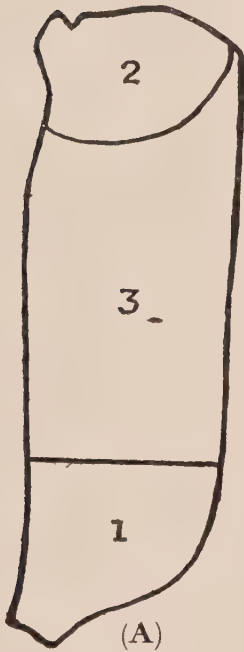
RECIPE II

For curing

1. ham
2. fore-ham
3. back
4. belly (2 portions)
chap

For use fresh

head
skirt
fillet
trotters
loin



RECIPE III

For curing

- (A) 1. ham
2. fore-ham
3. middle
or
(B) 1. long side or flick

For use fresh

head
chine
trotters
fillet
skirt



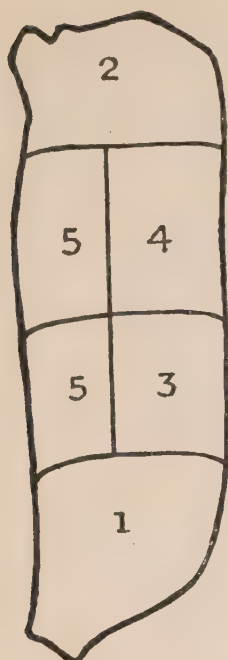
RECIPE IV

For curing

1. ham
2. jacket (known as
the flitch)

For use fresh or lightly salted

head
trotters
fillet
sk rt



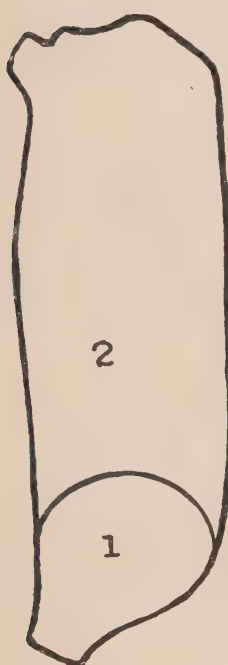
RECIPE V

For curing

1. ham
2. shoulder
3. fat bacon (loin)
4. interlean (back) bacon
5. belly (2 portions)
cheeks
eye-piece

For use fresh or lightly salted

fillet
trotters
skirt



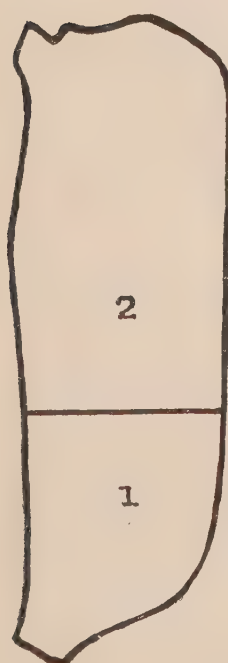
RECIPE VI

For curing

1. ham
2. jacket (known as
the flitch)
chawl (cheek)
trotters

For use fresh or lightly salted

head
fillet
ribs and } divided into
vertebral } bald rib
column } spare rib
loin
trotters
skirt



RECIPE VII

For curing

1. hind quarter
2. fore quarter

For use fresh or lightly salted

feet
shanks
head
bones
fillet
skirt

JUDGING HOME-CURED BACON AND HAMS

Those who give instruction in home-curing will probably be asked to judge bacon and hams at local shows. Sometimes the organizers may consult them before drawing up the schedule of classes. Several considerations must then be borne in mind.

The quality of cured meat depends not only on the way in which it has been cured, but on the conformation and carcass quality at slaughter. At all times, particularly in war time, there will be wide variations in the weight of pig killed. Sides may range from 50 to 100 lb. in weight, and will vary proportionately in the amount of fat which they contain. The feeding of pigs from different exhibitors is bound to vary considerably.

It is unlikely, too, that the owner of home-cured bacon or hams will want to have a sample cut and unless this is done it will be difficult to assess some important points.

Scales of points drawn up for judging Wiltshire cured sides, mostly aiming at judging the type of carcass, are of no value in judging home cured meat.

Bearing these points in mind it would be wise to discourage the holding of competitive classes. Much more good is likely to be done by demonstration of good curing, or better still—if no one's feelings are hurt—of good and bad samples.

POINTS TO LOOK FOR

If, however, competitive classes have been organized and some one has to judge them, the following points should be borne in mind in drawing up a score card or making awards.

WORKMANSHIP : Freedom from scores and bruises ; properly de-haired ; well butchered ; no unnecessary cuts in meat ; aitchbone and bladebone neatly removed ; trotters removed at correct joint. In hams : good clean cut ; well trimmed ; no pockets.

COLOUR : Normal colour of cut surface, even throughout ; no patches caused by under-salting ; if smoked, desirable even colour ; to what extent is this due to pea flour ?

FAT : White and firm ; [compare by pressure with ball of thumb ; no rancidity or oiliness.

CURE : This can only be really tested with a bacon trier and requires much experience. Meat should be firm ; no sign of sponginess and not excessively dried.

PESTS AND VERMIN : Examine for holes caused by larder beetle and for trimming necessitated by attacks of vermin.

SOUNDNESS : This must be judged chiefly on smell, giving particular attention to the blade-bone pocket and region of aitchbone. A trier should be used if the operator is experienced and the region near the knee explored for taint.

PERIOD IN CURE : In this respect it would probably be best to award credit marks on an increasing scale for period over six months from the time of slaughter.

REGULATIONS AFFECTING THE SLAUGHTER AND DISPOSAL OF PIGS

Slaughter and Disposal. In all cases of slaughter it is vital that the method of slaughter must not cause unnecessary suffering to the pig. This is a legal requirement under the Protection of Animals Act, 1911, Sect. 1. A person who offends against this requirement is liable to a fine or imprisonment. Pig keepers are therefore advised to employ an expert, preferably a recognized slaughterman, to do the job. The Slaughter of Animals Act, 1933, which requires the use of the "Humane Killer" applies only to slaughter in a slaughter house or knacker's yard.

Inspection of Meat. Under the Public Health (Meat) Regulations, 1924, it is necessary to notify the local authority of the intention to slaughter an animal if any part of the meat is offered for sale or intended for sale for human consumption. The fact that various organs and parts of the carcass may be unfit for human consumption on account of local infection makes it desirable that *all* meat should be examined by a qualified Meat Inspector. This is done free of charge. Apart from this, it is wise to keep in touch with local authorities whose desire is to help, not to hinder.

NATIONAL AND LOCAL CHANNELS OF INFORMATION

Up to now home curing has not been a subject associated with any special centre of education. The collecting and integrating of the available information, and the organizing of instruction in the subject has been the work of the Joint Committee on Home Curing.

The Secretary of the Committee has been the Secretary of the Small Pig Keepers' Council. A brief outline of the national and local channels of information linking those who are concerned with the breeding, production and curing of pigs for domestic consumption may be of assistance at this stage.

Those desiring advice on home curing should apply either to the local authority for agricultural education (for the services of the Rural Domestic Economy Instructress), or to the Regional Officer of the Small Pig Keepers' Council for their area.

Instructresses and instructors who want further technical information on any aspect of curing should apply to the Secretary of the Home Curing Committee.

If they require information about the feeding and management of pigs they should get into touch with the Agricultural Organizer for their county or with the Secretary of the Small Pig Keepers' Council.

Regulations affecting pig keeping by domestic pig keepers are constantly under review by the Small Pig Keepers' Council and problems relating to them should be referred to the Secretary of the Council, 64, Bell Street, Henley-on-Thames, Oxon. Food Executive Officers will be able to answer queries relating to permits to slaughter, etc.

APPENDIX I

UTILIZATION OF BY-PRODUCTS

As will be seen on p. 19 there is a large number of edible products other than the bacon that will become available during the process of home curing. Every effort should be made to obtain the maximum value from these and to avoid as far as possible the initial glut associated with pig killing, by preparing the various products so that they can be utilized over a period. Many of these may be consumed in a fresh condition, but by a little ingenuity many other tasty dishes can be evolved, and cooking will of course render them available over a longer period. Also the question of varying the diet is a factor which cannot be overlooked. The following ways of dealing with by-products will produce satisfactory results, but it is essential to stress that all ingredients

must be weighed. Tastes will vary in different localities but this matter can usually be dealt with by a judicious adjustment of the seasonings. At the present time most meat products intended FOR SALE are subject to various legal Orders both as regards their meat content and their price, but such restrictions do not apparently apply to home consumption and the recipes given do not of necessity comply with these regulations.

One of the most popular methods of using trimmings of lean and fat pork is by turning them into a meaty pork sausage. There should be no difficulty with this provided that a mincer is available, and even if a filling nozzle cannot be obtained the sausage meat can be fried in the form of rissoles.

PORK SAUSAGE

<i>Ingredients</i>		<i>Seasoning</i>
9 lb. lean pork	At the rate of $\frac{1}{2}$ oz. per lb. of meat	3 oz. salt
3 lb. firm pork fat (not flare)		1 oz. white pepper
3 lb. bread		$\frac{3}{4}$ oz. mace
		$\frac{1}{2}$ oz. ginger
		$\frac{1}{4}$ oz. ground sage

Trim off burnt portions of bread crust, cut into large cubes and place in water to soak. Place sausage skin in soak. Separate lean and fat and weigh out correct quantities. Run the meat and fat through the coarse plate of the mincer and thoroughly mix the seasoning with it. Squeeze out excessive moisture from the bread (it should absorb its own weight of water). Thoroughly mix all the ingredients and run the mass through the fine plate of the mincer. Remove the knife and attach filling nozzle. In some cases a special filling plate is provided, or the plate as well can be removed. Thread the skins on to the nozzle, and squeeze out excessive moisture with a clean cloth. Fill out and link as desired. Bread should be at least three days stale before it is used and it should be examined for sourness or mould growth. Sausages will cook better if they are hung in a cool situation for a period to permit the water content of the various ingredients to become balanced. For some localities the quantity of sage can be increased and in many rural areas rubbed sage is preferred to ground.

BRAWN

<i>Ingredients</i>	<i>Seasoning</i>
$\frac{1}{2}$ pig's head	32 parts grd. white pepper
1 pig's foot	1 part grd. mace
1 onion	1 part grd. ginger
$\frac{1}{2}$ lb. shin of beef	1 part grd. nutmeg
	(A few drops of oil of lemon will greatly improve flavour)
	Amount to taste

Remove eyes, brains, bristles and clean inside ears. Wash in salt water. Place head, foot and beef in pickling brine (*see* page 37) for a week. Remove, dry for 2-3 days, then cover with cold water, add seasoning, onion and boil for about 5-6 hours. When tender remove meat from bone, put ears through fine plate of mincer, and dice the meat. Return bones to pan with 1 qt. of liquid. Boil briskly to reduce liquid to 1 pt. and strain. Place the meat into damp moulds and add liquid. Turn out when set.

Note.—The tongue may be included. It should be cooked whole, skinned and placed in the centre of the mould.

Pork rinds, gristles, etc., can be included if desired, after salting, cooking and mincing through a fine plate.

TONGUE MOULD

Place tongue in brine for 4-5 days. Wash off, simmer for $1\frac{1}{2}$ to 2 hours. Remove skin. Place in small cake tin with root in centre. Cover with jelly stock and weight down.

MEAT LOAF

Ingredients
 $1\frac{1}{4}$ lb. pork scraps
1 lb. skretchings
 $1\frac{1}{4}$ lb. bread (3 days stale,
or rusk)
2 pints water

Seasoning
1 oz. salt
 $\frac{1}{4}$ oz. grd. white pepper
 $\frac{1}{4}$ oz. grd. parsley
 $\frac{1}{4}$ oz. grd. pimento
Amount to taste

Soak bread or rusk. Mince meat and skretchings. Add seasoning and mix all ingredients thoroughly (minced onion can be added if desired). Pass mass through fine plate of mincer. Press into well greased tins. Bake in moderate oven for 2 hours.

FAGGOTS

Ingredients
1 lb. lites, liver, heart,
melt, etc.
1 pig's caul
3 small onions
3 oz. bread crumbs (or
boiled potatoes)

Seasoning
5 parts of salt
1 part grd. white pepper
1 part grd. ginger
1 part grd. sage
1 part grd. pimento
(about 1 oz. of seasoning will be
required)

Soak caul in tepid water. Cover fry and onions with water and simmer $\frac{3}{4}$ hour. Drain off liquid, pour a little on crumbs, keep remainder for gravy. Mince fry, onion and breadcrumbs, add seasoning to taste and beat to smooth paste with fork. Cut caul into 4 in. squares. Form meat into balls and wrap a square of caul around each. Place on greased tin and brown quickly in hot oven.

BLACK PUDDINGS

Ingredients
8 lb. blood
4 lb. flare fat
 $\frac{3}{4}$ lb. pearl barley
 $\frac{3}{4}$ lb. fine oatmeal
 $\frac{3}{4}$ lb. flour
 $\frac{1}{2}$ lb. onion

Seasoning
7 parts of salt
3 parts of pepper
1 part pimento
1 part coriander
(about 5 oz. of seasoning will
be required)

Cube fat and scald in boiling water. Cook barley in cloth allowing room for swelling. Chop onions and cook lightly. Add to blood, seasonings, flour, oatmeal and cooked barley; mix well. Add onion and fat and fill through funnel into skins. Tie into lb. rings and cook at 180° F. for about 40 minutes, or until no blood exudes when pricked.

BLACK PUDDINGS (Baked)

Ingredients
1 qt. pig's blood
1 qt. milk (dried)
1 lb. bread (stale)
1 lb. beef suet
 $\frac{1}{2}$ lb. barley
 $\frac{1}{2}$ lb. rice
 $\frac{1}{4}$ lb. dry oatmeal

Seasoning
Black pudding seasoning can
be used, to taste

Cook rice and barley in water until well cooked. Pour milk (or water) over bread. Pour blood over bread, grate suet and mix. Season well and cook in greased shallow tins until cooked through. To use, warm in frying pan.

PORK PIE

Pastry
 $\frac{1}{2}$ lb. flour
 3 oz. lard
 $\frac{1}{4}$ teaspoon salt
 $\frac{1}{4}$ pint water or water and milk
 Beaten egg to glaze (or use milk)

Filling
 $\frac{3}{4}$ lb. lean pork

Seasoning
 (Pork sausage seasoning
 can be used)
Stock : 2 tablespoonsful

Cut pork into dice, add seasoning (or herbs), moisten with stock.

PASTE: Sieve flour into warm basin, rub in fat (1). Pour on boiling liquid and mix with wooden spoon. Knead quickly but thoroughly and use at once. Mould into shape; pinning round a piece of kitchen paper to assist.

Put in filling, brush edges and place on lid, decorate if desired. Make hole in centre and brush with beaten egg (or milk) (2). Put into hot oven, lower heat after $\frac{1}{2}$ hour and cook 1 hour more, remove paper after $\frac{1}{2}$ hour, test with skewer if meat is done. Allow to cool somewhat before pouring in jelly stock (3).

ALTERNATIVES.

- (1) Heat fat in water and pour into warmed flour.
- (2) Brush with beaten egg (or milk) $\frac{1}{2}$ hour before removing pie from oven.
- (3) If pies are to be kept, do not pour in jelly stock until they are to be used.

LIVER SAUSAGE

Ingredients
 6 lb. pig's head meat
 3 lb. liver
 $1\frac{1}{4}$ lb. flour
 6 oz. cornflour
 $\frac{3}{4}$ lb. bread or rusk
 $1\frac{1}{2}$ oz. onion fried in fat
 Stock

Seasoning
 2 lb. salt
 13 oz. white pepper
 $\frac{1}{2}$ oz. cayenne pepper
 3 oz. marjoram
 $\frac{1}{2}$ oz. sage
 $1\frac{1}{2}$ oz. pimento
 $\frac{1}{2}$ oz. mace

(Amount— $\frac{1}{2}$ oz. per lb. of meat)

Cook head until quite tender. Bleach liver by slicing and soaking in water at 140° F. Mix bread, flour and cornflour dry. Add to meat whilst chopping. Distribute seasonings and add stock from head to obtain correct consistency. Mince to a fine paste. Fill into middles or fat ends. Cook 45 minutes at 180° F. Keep under water whilst cooking. When cooked plunge into cold water to set.

HOG PUDDING

Ingredients
 3 lb. pluck meat, including lites, or trimmings, etc.
 1 lb. groats, rice or pearl barley

Boil the lites, etc., $\frac{3}{4}$ hour. Soak 1 lb. groats (rice or pearl barley) in the liquor till next day. Boil groats loosely in a bag for $3\frac{1}{2}$ hours. Mince the meat and add seasoning. Cut the clean large intestines into 12 in. lengths and tie one end with string. Mix all ingredients and add water to obtain correct consistency. Fill out into the skins. Tie off into rings. Cook in boiling water for about 30 minutes. Hang to set. Eat cold, fried or boiled in slices or whole.

MATRIMONY CAKE

Short Crust Pastry

$\frac{1}{2}$ lb. flour
3 oz. fat

Filling

1 chopped apple
2 oz. chopped dried fruit
 $1\frac{1}{2}$ oz. sugar
2 oz. skretchings
A little spice

Line a plate or tartlet tins with short crust pastry. Put filling in the pastry. Cover with another round of pastry, and bake in a hot oven.

HASLET

Ingredients

6 lb. fairly lean pork
 $1\frac{1}{2}$ lb. stale bread

Seasoning

2 oz. salt
 $\frac{1}{2}$ oz. white pepper
 $\frac{1}{4}$ oz. rubbed sage
Onion (optional)

Trim off bread crust, cut into cubes and place in water to soak. Run the meat through the coarse plate of the mincer and thoroughly mix the seasoning with it. Squeeze out the excessive moisture from the bread, fairly thoroughly. Mix all the ingredients and run the mass through the fine plate of the mincer. Form into oblong shapes, wrap each one in pig's caul and roast in a moderate oven.

LIVER PÂTE

Ingredients

$\frac{3}{4}$ lb. pigs liver
14 oz. fat
Pepper
Salt

Seasoning

Herbs to flavour
1 tumbler water (6 oz.)

Mince liver and fat very finely. Add water, herbs and seasonings, and cook very slowly in a pan with the lid on. Put through a hair sieve and pack into moulds.

RENDERING LARD

1ST QUALITY

The flare (flair, flead, or leaf) and caul should be used in the preparation of best lard. All fats for rendering should be used as soon as possible after their removal from the carcass. Trim away all skin and any adhering flesh and cut the fat into $\frac{1}{4}$ in. cubes, then run through coarse plate mincer. Melt slowly over a gentle heat. It is a good plan to place a small quantity of lard in first to prevent scorching. Stir frequently. When all the fat has become clear oil, and the tissues have shrivelled to skretchings, tammy (i.e., wring) through a cheese cloth and strain into bladders or airtight jars.

2ND QUALITY

Any other portions of fat, including the gut fat, provided the glands are trimmed away and it does not smell too strongly, can be rendered for a poorer grade of lard. With these fats it is desirable to break them down on a mincer first to obtain a good percentage of fat. Clarify as above. The skretchings may be eaten with bread and salt, or they can be run through the fine plate of a mincer to be included in meat loaf or similar products.

STOMACH

This can be thoroughly cleaned, the inner lining removed and cooked as tripe, or it may be used as a container for a hog pudding or brawn filler. In some parts it is cooked and cubed for use in brawn and cooked sausage, etc.

CHITTERLINGS

As a rule these are prepared from the large intestine and stomach of the pig. The viscera are laid out and the stomach removed, the small intestines being run off for sausage containers. The large intestine is trimmed free of fat, emptied and turned inside out on a stick. The mucous lining is removed from both the large intestine and stomach and they are thoroughly washed in salt water. When perfectly cleaned they are boiled until tender and cooled off in cold water. In many areas the cleaned intestines are plaited prior to cooking.

SAUSAGE CASINGS

For this purpose the small intestine is used. Trim away any adhering fat and place the skins in water for about 48 hours, using several changes of water. Turn the skins either on a tap or stick, and with a stick or back of a knife scrape away the slime. Sprinkle with salt and allow to drain. If the casings are to be kept they must be resalted with dry salt and packed down tightly in salt. The skins should not be in contact with the atmosphere.

RINDS AND GRISTLES

These can be cooked down for jelly stock, the residues being minced and used in faggots and similar products.

TROTTERS AND TAIL

These can be placed in pickle for about 3 days and boiled.

APPENDIX II

WEIGHTS

Weights of pigs are often given without stating whether it is the live weight or the dead weight that is concerned. The expression dead weight is taken to mean the weight of the carcass after evisceration, and was defined in the contracts of the Pigs Marketing Scheme as meaning "the weight (after the animal heat has departed) of a dressed carcass including the skin, the head with the tongue, the kidneys, the tenderloins, the flick or flare, the tails, the backbone and the feet." If any pig was weighed before the animal heat had departed, the scale of deduction for shrinkage from hot to cold dead weight was as follows:—

<i>Dead weight (hot)</i>	<i>Shrinkage</i>
Up to 9 sc. 9 lb.	4 lb.
9 sc. 10 lb. to 10 sc. 15 lb.	5 lb.
Over 10 sc. 15 lb.	6 lb.

The primary offals, which are not included with the carcass are the blood, pluck (including lungs, heart, liver, oesophagus and trachea) abdominal contents (including stomach, intestines, spleen) bladder and mesenteric fat.

In cattle and sheep the primary offals include head, feet, tail and skin.

Those parts of the carcass which are removed before curing are often spoken of as offals, but it is wise to refer to them as secondary offals; they include head, feet, tail, fillet, kidneys, flare fat, bones and trimmings.

It is important that people having a pig killed for them by a butcher, or selling one side to a butcher or bacon factory, should understand the basis on which carcass weights and the weights of offals are calculated.

Dead weights of pigs are usually given in scores of 20 lb. if killed at bacon factories, and stones of 14 lb. if killed at local butchers, but Ministry of Food prices are now all given in scores. There used to be a Smithfield stone of 8 lb., but its use is now illegal. (For every 14 lb. live weight of an average bullock one could expect to get 8 lb. carcass weight.)

Live weights are preferably expressed in lb. but are commonly given in either scores or stones. It is essential to know whether the weight given for a live pig is its live weight or its dead weight, as a live pig is sometimes described by its estimated dead weight.

Specimen Carcass Analysis

The following analysis can be taken as a guide to the approximate weights likely to be obtained from an average quality pig of 200 lb. live weight. The percentages will vary materially for pigs of lighter or heavier weights.

The weight of trimmings may vary considerably according to the method of cutting adopted, and if sides are boned for rolling this will have an obvious effect.

				TOTAL WEIGHT				APPROX. PERCENTAGE	
Primary Offals				lb. oz.		lb. oz.		OF LIVE WEIGHT	
Blood	...	...	...	6	4				
Thymus (sweetbread)	...	...	...		5				
Diaphragm	...	...	...		14				
Lungs and trachea	...	...	...	1	7				
Heart	...	...	...		9				
Liver	...	...	...	3	0				
Spleen	...	...	...		3½				
Pancreas	...	...	...		4				
Kidneys	...	...	...		8½				
Flare fat	...	...	...	4	8				
Caul fat (omentum)	...	...	...		5				
Gut fat (mesentery)	...	...	...	2	5	20	9		10.3
<hr/>									
Oesophagus	...	...	...		2				
Stomach empty	...	...	...	1	1				
Intestines empty	...	...	...	5	8	6	11		3.4
<hr/>									
Hooves and hair	...	...	...	1	4				
Gall bag, bladder, etc.	...	...	...		6	1	10		0.8
<hr/>									
Loss, intestinal content, evaporation, etc.				21	2	21	2		10.5
<hr/>									
Cold Carcass, ex kidneys and flare				150	0	150	0		75.0
<hr/>									
Totals						200	0		100.0
<hr/>									
Secondary Offals									
Head, ex. tongue	...	...	...	13	12				
Tongue	...	...	...		12				
Fillet...	...	...	...	1	8				
Trimmings, fat and tail	...	...	...	5	4				
Bones and trotters	...	...	...	8	12	30	0		15.0
<hr/>									
2 DRESSED SIDES, prepared for cutting and curing.						120	0		60.0

APPENDIX III

GLOSSARY

The following list of technical and local terms has been compiled from various sources. It is obviously far from complete, but it is submitted as a preliminary guide. Additions and corrections will be fully considered by the Secretary of the Home Curing Committee, 64, Bell Street, Henley-on-Thames.

DESCRIPTION	COMMON OR LOCAL NAME	DISTRICT
Kinds of Pig		
Castrated young male	Hog Barrow Cut pig	Devon
Fattening pigs:		
8 to 16 weeks	Slips	
16 weeks	Strong slips (market term)	
16 weeks when in yards for feeding	Stores	
Maiden female	Gilt Yelt Yilt Hilt Spinder (?)	
Castrated boar	Stag Brawner	
Female after first litter weaned ...	Sow	
Thriftless small pig in litter ...	Dolly Anthony Sharger Runt	Aberdeen
Young pig	Spriggin Hogget	
Thriftless pig	Dillon Cad Rutling Ritling Greck	
Bones		
Backbone, vertebral column ...	Chine	
Portion of half of the pelvic girdle attached to a leg	Aitch Bone H. Bone or Leech Bone	
Ribs, particularly those at the head end	Spare ribs	
Shoulder blade		
Scapula	Blade Bone	
Portion of pelvic girdle attached to backbone	Oyster Bone	

Cuts

A number of cuts consist essentially of bones with a small amount of meat or fat attached to them. Usually they are given the same name as the bones, but should not be confused with them.

Hind leg cut from the carcass before curing	Ham
do. cut well round the H. bone ...	Long Cut Ham
do. cut close to the end of the femur	Short Cut Ham
Hind leg cut off a Wiltshire cut side after curing	Gammon

DESCRIPTION	COMMON OR LOCAL NAME	DISTRICT
Cuts — <i>continued</i>		
Fore leg cut from the side like a ham	Shoulder Ham Picnic Ham Fore Gammon Spring	Dorset
Front part of Wiltshire-cut side cut just behind elbow	Fore End	
Chine bone with 1 or 2 inches of meat and fat on either side	Chine	
Lean meat attached to ribs	Spare rib	
Lean meat attached to half of back- bone in region of loin	Griskin	
Side from which a straight cut ham has been removed	Spencer	
Side from which a round cut ham has been removed	Jacket	
Middle part of Wiltshire-cut side ...	Middle	
Lower part of middle	Streak Belly	
Jowl, including lower jaw	Chap Chaw Chapper	Staffs Devon and Somerset
do. cured and smoked	Bath Chap	
Face, excluding lower jaw	Eyepiece Cheek	
Feet	Trotters Pettitoes	
Skin	Swarth	
Fresh shoulder	Hand of Pork	
Spare rib	Short Bones	
Fats		
Carcass fat over back and loin ...	Back fat	
Fat lining the abdominal wall and running up round kidneys	Flare or Flair Leaf Flead Flick Body fat Brack	Devon do.
Fatty membrane surrounding stomach (Omentum)	Caul Veil Kell Kurtzer	
Fat included in the mesentery ...	Mesenteric Fat Mudgeon Midgeon Mudgerum Midrum Gut Fat Crow Frill	Staffs

DESCRIPTION					COMMON OR LOCAL NAME	DISTRICT
Offals						
Intestines	...	...	...	..	Bellies (not to be confused with Belly Cut) Innards Pots Puddings	
Small intestines	...	...	...	...	Casings Tharms	
Large intestines	...	...	...	...	Chitterlings Nedlings Netlings Notlings	
Oesophagus	...	...	...	...	Gullet	
Trachea	...	...	...	...	Windpipe	
Lungs	...	...	...	...	Lights or Lites	
Spleen	...	...	...	...	Milt Melt " Long Life "	Lincs
Stomach	...	...	...	...	Maybag Maw Nightcap	Devon
Connective tissue after rendering lard					Skretchings Scribbings Greaves Graves Kribbens Brousles	Monmouth Devon
Liver, Heart, Spleen, Gullet fat, Gut fat and occasionally trimmings, and Tongue					Pigs Fry Henge Inmeats	Devon
Lungs, Heart, Liver, Trachea, Oesophagus					Pluck Race Haslet	Monmouth
Equipment						
Curing tub with lid	...	...	...	...	Salter	
Shallow trough of stoneware	...	...	...	...	Thrall	Staffs
Shallow wooden trough on legs	...	...	...	...	Standard Trundle Salter	Devon Somerset
Oval tub with legs	...	...	...	...	Coolin Turner	
Bundles of straw for singeing	...	...	...	...	Boltings Patterns	
Stretcher for carrying carcass	...	...	...	...	Cratch	Lincs
Condition of Bacon						
Rancid	...	...	...	...	Reasty Rusty	
Mitey	...	...	...	...	Minty	

APPENDIX IV

BIBLIOGRAPHY

(Many of the publications listed are likely to be out of print, but copies should be available for reference at certain public libraries.)

Bacon Curing. The Dry-salt and Tank Curing of Wiltshire Sides. By E. H. Callow. Food Investigation Leaflet No. 5. Department of Scientific and Industrial Research, London, 1938. Free and post free.

Bacon and Hams. By George Nicholls. Institute of Certificated Grocers, London, 1924. 5s.

Carcass Quality of the Pig in Relation to Growth and Diet. By E. H. Callow. The Empire Journal of Experimental Agriculture, Vol. III, No. 9, January, 1935.

Douglas's Encyclopaedia. Douglas Ltd., London.

Farm Meats. By M. O. Helser. The Macmillan Company, New York, 1923.

Feeding and Management in Relation to Carcass Quality in Bacon Pigs. By H. R. Davidson. Journal of the Royal Agricultural Society of England, Vol. 95, 1934.

Food Industries Manual. Leonard Hill, Ltd., London, 1930. (Articles on "Curing of Bacon and Ham" and "Pork Preparation for Curing.")

A Handbook on Meat. By R. C. Hammett and W. H. Nevell. The Meat Trades' Journal Co., Ltd., London, 1929.

Home Curing of Bacon and Hams. Advisory Leaflet 173. Ministry of Agriculture and Fisheries. Published by H.M. Stationery Office, 1945. 1d. (2d. post free).

Home Curing of the Pig and Use of By-products. Advisory Leaflet No. 6. Small Pig Keepers' Council, 64, Bell Street, Henley-on-Thames, Oxon, 1941. Free and post free.

Improvement of Carcass Quality in Pigs. By C. P. McMeekan and John Hammond. Journal of the Ministry of Agriculture, June, 1939.

Meaty Miniatures. By Frank Gerrard. The Meat Trades' Journal Co. Ltd., London, 1940. 2s. 6d.

Meat Industry (The). By H. B. Cronshaw and D. J. Anthony. Baillière, Tindall & Cox, London, 1927.

Meats and Meat Products. By W. H. Tomhave. Lippincott's Farm Manuals. J. B. Lippincott Co., Chicago, 1925. 12s. 6d.

Pigs and Bacon Curing. By R. E. Davies. Crosby Lockwood & Son, London, 1931. 4s. 6d.

Pig Carcasses for Wiltshire Bacon. By H. R. Davidson & J. Andreasen. Journal of the Ministry of Agriculture, March, 1927.

Retail Meat Trader (The). By numerous contributors. The Gresham Publishing Co., Ltd., London, 1928.

Sausage and Small Goods. By Frank Gerrard. Leonard Hill, Ltd., London, 1942. 10s. 6d.

Standard Cyclopaedia of Modern Agriculture. Edited by Prof. R. P. Wright. The Gresham Publishing Co., London, 1908. (Article on "Bacon Curing.")

Ten Lessons on Meat for Use in Schools. The National Live Stock and Meat Board, Department of Home Economics, Chicago, Illinois, 1939.

INDEX

	<i>Page</i>		<i>Page</i>
Animal tissues—		Dead animals	20
Changes in	26	Dehairing	18
Composition of	25, 26	Dehydration of meat	28
Bacon cuts	11, 12, 23	Disembowelling	18
Belly	7	Drying bacon	24, 39
Black pudding recipes	51	,, meat	28
Bleeding	17, 18	Dry curing	30, 31, 34, 37, 38
Bleeding, incomplete	20		
Blood	17	Edible offal	7-10, 19
Boars	16	Evisceration	18
Body composition... ..	3-10, 12, 13	Electrolethaler	17, 48
Bone composition	3, 26	Equipment for curing	24
Bone taint	26, 32		
Bones	3-6	Faggots recipe	51
Brawn recipe	50	Fasting of pig	16
Breeds	13	Fat, composition of	25
Brine, cleansing	37	,, production of	14
,, pickling	37	,, rancidity of	14, 27, 39
Bruising	17	,, soft	14
		,, sows	16
Carcass analysis	55	Fatigue, effect of	17, 26
,, inspection	19-21	Feeding	12, 13, 15, 16
Castration	15, 16	Fevered flesh	20
Carving of ham	42	Flies	24, 40
Cheese fly	40	Food values	33
Chine	19, 22, 36	Fore end	6, 12, 36
Cleansing of joints	37	Freezing, effect of	27
Cooking home cured meat	40, 41		
Cooling carcass	19, 27	Gas storage	28
Conformation	12	Gilts	15
Connective tissue	25	Glands, diseased	19, 20
Cure, standard graduated	33, 35-39	Glossary	56-58
Cures, others	40-47	Glycogen	26
Curing, historical	1	Gutting	18
,, local methods	40-47	Graduated cure	33, 35-39
,, ingredients	28-33		
,, mixture	37, 38	Ham	6, 11, 36
,, old recipes	2, 3	,, cooking	40-42
,, room	24	,, glazing	41
Cuts, ideal	10, 11	,, carving	42
Cutting	6, 7, 21, 23, 35-37	Hardness of meat	32, 33
,, equipment	24	Haslet recipe	53
,, for graduated cure	35-37		
,, methods	21-23		

INDEX—continued

	Page		Page
Home curing	2, 33-39	Pistols, captive bolt	17
„ „ time of year	15	Pork pie recipe	52
Hog pudding recipe	52	Pork sausage recipe	50
Hoisting	18	Post mortem changes	26
Housing of pig	15	Premises	24
Inedible offal	19	Preservation of meat	27-33
Inspection of carcass	19-21	Preservatives	28, 29
„ „ offals	19-21	Pre-slaughter care	16, 17
„ method of	20, 21	Primary offals	7-10, 19, 54
„ regulations	49	Purging brine	37
		Putrefaction of meat	27, 28
Judging of home-cured bacon	48	Rancidity	14, 27
		Rats and mice	24, 40
Lactic acid	26, 27	Reasons for graduated cure	34
Lard, rendering of, recipe	53	Recipes :	
Larder beetle	40	Brawn	50
Lean meat	25	Black puddings	51
Liver sausage recipe	52	Faggots	51
Liver pâte	53	Haslet	53
Local terms	56-58	Hog pudding	52
		Liver pâte	53
Matrimony cake, recipe	53	Liver sausage	52
Maturation of bacon	38	Matrimony cake	53
Meat loaf recipe	51	Meat loaf	51
Mechanical refrigeration	2	Pork pie	52
Middle	6, 11, 36	Pork sausage	50
Mites	40	Reference books	59
Moulds	40	Resting pig	16, 17
		Rendering lard recipe	53
Nitrate, sodium and potassium	32		
Nitrite	32	Salt	29-32
		„ amount	31, 33, 38
		„ bad, spent	38
		„ methods of applying	30, 31, 37, 38
		„ rate of penetration	27, 30-32
Odours, abnormal... ..	20	Salting	30, 37, 38
Offals	7, 8, 9, 10, 19	Sal prunelle	32
„ inspection of	19-21	Saltpetre	32
„ primary	7-10, 19, 54	„ action of	32
„ secondary	11, 19, 22, 54	Sausage casings	54
Organs	7-10	Scalding	18
		Secondary offals	11, 19, 22, 54
Packing in salt	38	Shoulder sticking	7, 17
Pests	40	Singeing	18
Pharmaceutical products... ..	19		
Pickling	25, 31, 37		

INDEX—*continued*

	<i>Page</i>		<i>Page</i>
Skeleton	3-7	Temperature for curing	24
Skin, composition of	26	Time in salt	11, 31, 32, 34
Skipper Jack	40	Tongue mould, recipe	51
Slaughter	16, 17	Tissues, composition	25, 26
„ regulations	48	Tuberculosis	20
Slime on cured meats	24, 38-40	Types of pigs	13
Smoking	39		
Splitting carcass	18, 19, 35	Utensils, for curing	24
Standard graduated cure... ..	33-39		
Sticking	7, 17	Washing of cured meats	38
Stunning	17	Weight, dead	54, 55
Stomach	9, 53	Weight, live	54, 55
Storage of bacon	24, 25, 39		
Sugar	32, 33		

represents the last word in home curing or is necessarily superior to other cures as regards the flavour or quality of bacon.

Apart from verbal amendments the text relating to the technical aspects of curing remains virtually unchanged. But the sections about salt and local cures have been revised; there has been some rearrangement of the order of material; an index has been added, the bibliography extended, and the section dealing with regulations—in themselves so liable to change—drastically reduced.

The possibility of a still more comprehensive textbook on a subject about which there is still a good deal to record, if not to learn, remains in mind, but further experience is required before attempting anything more ambitious than the present work.

Suggestions and corrections will be welcomed.

April, 1945.

CEDRIC DREWE,

Chairman,

Small Pig Keepers' Council.

The members of the Home Curing Committee are:

JOHN HAMMOND, M.A., D.Sc., F.R.S., School of Agriculture, Cambridge
J. B. BUSBY

E. H. CALLOW, B.Sc., Ph.D., F.R.I.C., Low Temperature Research
Station, Cambridge

*MRS. CHISHOLM, N.D.D., Senior R.D.E. Instructress, Somerset County
Council

MRS. U. COOLING, N.D.D., Ministry of Agriculture

H. R. DAVIDSON, M.A., Dip. Agr.

F. W. GENTLE

F. GERRARD, M.R.San.I., Senior Commodity Lecturer, Smithfield
Institute

MISS E. H. PRATT, O.B.E., M.A., Ministry of Agriculture

MRS. S. STEVENS, M.A., Ph.D., Ministry of Agriculture

ALEC HOBSON, O.B.E., Secretary, Small Pig Keepers' Council

* Mrs. Chisholm found it necessary to resign from membership, but not until she had rendered most valuable service to the Committee.

